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Portuguese Validation of the Youth Sport Environment Questionnaire (YSEQ) for the Physical Education Context

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Abstract: Group cohesion is a prominent feature of sport involvement and small group work. Despite long-standing research interest and varied conceptualizations across fields, studies have primarily focused on sports. Research in educational contexts, particularly in physical education (PE), has been limited, even though PE offers an environment conducive to fostering diverse opportunities that promote group cohesion. This study sought to adapt and validate the Portuguese version of the Youth Sport Environment Questionnaire (YSEQ) using confirmatory factor analysis. The participants were 460 Portuguese-speaking PE students (58.9% girls, aged 14–19) who completed the YSEQ. After removing four items, the confirmatory factor analysis validated the two-factor structure of the YSEQ, supporting its appropriateness for the Portuguese context. This adapted 14-item YSEQ showed metric invariance across gender, and its two dimensions exhibited good internal consistency and convergent and discriminant validity. Significant correlations between the YSEQ and social affiliation scores confirmed the YSEQ's concurrent validity. These findings suggest that the adapted Portuguese YSEQ is a reliable and valid instrument for measuring group cohesion in physical education. This instrument allows teachers, researchers, and sports psychologists to better understand group dynamics, assess task and social cohesion in middle and secondary PE classes, and identify potential difficulties in this area.

Keywords: measurement; psychometric properties; task cohesion; social cohesion



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1. Introduction

Sport has the potential to promote the positive development of youth, largely by providing opportunities to develop powerful interpersonal bonds and a strong sense of group cohesion [1,2]. Cohesion is a social psychological construct that reflects the extent to which group members are attracted to each other, united, and committed to their shared goals [3,4]. Based on a theory-driven model, cohesion is addressed through two main perspectives: task cohesion, which focuses on the extent to which members collaborate to achieve common objectives, and social cohesion, which emphasizes the quality of relationships and the strength of interpersonal bonds within the group. This model also considers perceptions of individual attraction to the group, including personal motivations, feelings of belonging, and integration, reflecting the sense of group unity and proximity [5].

In the context of sports, group cohesion plays a crucial role not only in enhancing team performance but also in fostering the holistic development of participants. As noted by Eys et al. [6] cohesive groups create an environment where athletes are more likely to experience positive interactions, thus enhancing their personal and social development.

Through the task-oriented aspect of cohesion, athletes learn to cooperate, communicate effectively, and work towards shared goals, skills that are transferable to other life contexts, such as academic settings, workplaces, and community involvement [7]. Moreover, the social dimension of cohesion enables participants to build strong interpersonal

connections, which can be fundamental for their social development. According to [8], cohesive sports teams can foster a sense of belonging and support that enhances emotional and social well-being. By creating a supportive and inclusive environment, cohesive sports teams can encourage the development of empathy, respect, and trust among members. These experiences of social integration and positive group dynamics reinforce social skills, emotional regulation, and the ability to navigate complex social interactions [2].

Additionally, the attraction to the group and the sense of belonging that arises from cohesive sports environments can enhance self-esteem, motivation, and well-being [8]. For young athletes, feeling connected to a group and being part of a team provides a sense of identity and security, which are important during critical stages of personal development [9]. As such, the cohesive nature of sports teams can play a vital role in fostering not only athletic growth but also broader social competencies, aiding in overall positive youth development.

With the aim of assessing the cohesion in athletes, Carron, Widmeyer and Brawley [3] developed the Group Environment Questionnaire (GEQ), which stands as the first instrument of its kind. The GEQ offers a comprehensive framework for evaluating the multidimensional nature of cohesion within groups, particularly in the context of team sports. This instrument encompasses various facets of group dynamics, including four dimensions: social cohesion, task cohesion, individual attraction to the group, and group integration. By employing a theoretical model that differentiates among these dimensions, the GEQ enables a nuanced understanding of how cohesion functions and its impact on group performance. Its establishment has significantly advanced the empirical study of group cohesion, providing valuable insights for researchers and practitioners alike.

Despite the recognition of the Group Environment Questionnaire (GEQ) as a useful, valid, and contemporary measurement tool for assessing group cohesion among athletes aged 18 to 30, several studies have questioned its validity for younger individuals [10–12]. These studies suggest the necessity for age-appropriate questionnaires, as the complexity of certain language, words, and phrases within the GEQ may lead to readability and comprehension difficulties among younger populations.

In response to these concerns, researchers focused on group dynamics [13] have advocated for the development of an instrument specifically designed for adolescents. Accordingly, Eys, Loughhead, Bray and Carron [6] introduced the Youth Sport Environment Questionnaire (YSEQ), suitable for adolescents aged 13 to 17, to provide a more accurate understanding of cohesion. A notable difference of the YSEQ is its measurement of cohesion within a two-factor structure, differentiated across the task and social domains of group involvement, comprising 16 positively worded items and two negatively worded items. The task cohesion dimension reflects how participants are integrated and motivated toward the group's collective performance, goals, and objectives, while the social cohesion aspect pertains to group relationships, focusing on how well members are socially integrated and the degree to which they are attracted to the social facets of the group.

Several studies using the YSEQ have validated its theoretical consistency and psychometric properties across diverse demographic samples, mainly within sports settings [14–16]. While there is a need for age-appropriate questionnaires, the significance of cohesion in sports has also spurred the demand for language-specific adaptations. To date, and to the best of our knowledge, validation has been conducted in Portuguese for the Brazilian population [14], as well for Czech and Slovak [17] and Farsi speakers [16]. Although Junior, Granja, Fortes, Freire, Oliveira and Peixoto [14] present an instrument validated for the Portuguese language, the fact that the sample consists of Brazilian participants means that its validity, reliability, and generalizability to other Portuguese-speaking countries, namely Portugal, remain unknown.

There is substantial evidence suggesting that cohesion is linked to enhanced individual and team performance, as well as sustained participation. Team cohesion and performance exhibit a reciprocal relationship; higher levels of task and social cohesion contribute to improved performances, while enhanced team performances foster increased feelings of

task and social cohesion [8]. Although group cohesion has captivated researchers and has been conceptualized in various ways across fields, the primary focus has remained within the sports context, with relatively limited research conducted in educational settings, particularly in physical education (PE) [6,14]. Group cohesion in PE classes is highly relevant, as it directly impacts the learning environment, student engagement, and the development of social and emotional competencies [18,19]. Cohesive groups are more likely to cultivate a positive atmosphere in which students feel more comfortable participating, sharing ideas, and facing challenges. Such groups tend to demonstrate greater effort, which in turn enhances their physical abilities and social skills [20,21].

In PE, students who identify as part of a group, feel close to their peers and are engaged in both tasks and social activities are more likely to exhibit a strong desire to remain with the group and demonstrate sustained commitment, which also enhances their self-esteem. When students are part of cohesive groups and derive enjoyment from their involvement, the likelihood of experiencing positive emotions and developing skills such as empathy, communication, and conflict resolution increases [22]. In cohesive groups, students are more inclined to respect and support one another, which can help reduce behaviors associated with bullying and social exclusion, thus fostering a more inclusive and secure environment [23,24]. A unified group also tends to provide support during challenging moments, encouraging members to persevere and overcome physical or emotional obstacles encountered in classes [25]. Moreover, cohesion can reduce attendance issues, such as tardiness or missed classes, while encouraging greater effort, commitment, and dedication [22]. Given these factors, PE presents itself as an optimal environment for providing a diverse range of opportunities that foster group cohesion, making it particularly well-suited for examining the influence of this variable on student behavior. Examining group cohesion in PE classes is essential for understanding how to foster a collaborative, inclusive, and effective learning environment, while simultaneously supporting the development of crucial life skills among students [26]. However, to date, no validation has been developed for the Portuguese population that is specifically adapted to the PE context. Accurate measurement tools allows educators and researchers to assess the group dynamics within Portuguese student groups in PE classes, offering the potential to identify issues and implement strategies to strengthen unity, teamwork, and interpersonal skills. This, in turn, enhances students' practice and contributes to their overall personal and academic development [22,27,28].

The current study aimed to provide a reliable and valid Portuguese version of the YSEQ, specifically adapted for the context of PE, to assess the perception of group cohesion among PE students.

2. Materials and Methods

2.1. Study Design

This study follows a cross-sectional design to validate the translated and adapted group cohesion instrument for use in Portuguese PE classes. The study aims to assess both the construct validity and reliability of the instrument through a series of psychometric tests.

2.2. Participants

The sample consisted of 460 Portuguese students (58.9% girls), aged 14 to 19 ($M = 16.44$, $SD = 1.08$), selected by convenience sampling [29] from seven schools in northwestern Portugal. All students participated in PE classes, with 22 students (4.7%) in the 9th grade, 193 (41.9%) in the 10th grade, 11 (15.3%) in the 11th grade, and 174 (37.8%) in the 12th grade, and all participating in PE classes. Each class included two PE lessons per week (one of 45 min and one of 90 min). At the time of the study, 26.5% of the participants ($n = 122$) were athletes.

To calculate the sample size, a proportion of at least 25 participants was considered for each question in the questionnaire, higher than the general recommendation of 10:1 found in the literature, which allows for more accurate analyses [30].

2.3. Procedures

2.3.1. Translation and Adaptation Procedures

To ensure the accuracy and validity of the Portuguese YSEQ, an expert group of translators and academics was assembled to oversee the translation, adaptation, and content validation process. The group included three translators, an external bilingual speaker fluent in both Portuguese and English, and three academics with PhDs in Physical Education/Sport Psychology.

With the permission of the author of the questionnaire, Professor Mark Eys (personal communication), the YSEQ was translated from English into European Portuguese using the forward- and back-translation technique [31].

The translation process involved three members of the research group and the external bilingual fluent speaker. Two native Portuguese-speaking educational researchers independently translated the items, which were then revised and compared. The resulting translated version was reviewed by a Portuguese-speaking expert in educational research.

A professional bilingual translator, who was not involved in the initial translation, then performed a back-translation of the questionnaire. Finally, a comparison was conducted of the back-translated version and of the original English version of the questionnaire by both Portuguese- and English-speaking natives.

To ensure content validity, a panel of experts [32] reviewed the Portuguese version of the YSEQ to evaluate the quality and suitability of the items for the PE context.

To assess face validity, a pilot study of the Portuguese YSEQ was conducted to evaluate the questionnaire's structure, the data collection procedures, and potential problems with item wording. Fifty high school students completed the survey. Based on participant feedback, minor modifications were made, but the overall structure of the survey remained unchanged. All participants were able to finish the questionnaire in approximately 5 min.

2.3.2. Data Collection Procedures

This psychometric study was conducted from January to June 2023 and involved translating and adapting the YSEQ from English into European Portuguese, followed by a psychometric validation of the Portuguese version.

Prior to data collection, the study was reviewed and approved by the University Ethics Board (reference: CEFAD 38_2022) and adhered to the standards set by the Declaration of Helsinki. The data were fully encrypted to guarantee the privacy of the participants. School principals and PE teachers were informed about the study's aims and methods and invited to participate. After obtaining school authorization, informed written consent was obtained from participants and their parents (if under 18 years old) after explaining the study's purpose, voluntary participation, the right to withdraw at any time, and the guarantee of anonymity and confidentiality. No incentives or rewards were offered for participation. All parents and participants, including those under 18 years, signed assent forms.

Participants completed the questionnaires in their classroom in the presence of a member of the researcher team, who explained the study and provided information regarding the completion of the questionnaire. The anonymity of the responses was emphasized, and participants were informed that there were no right or wrong answers, but that they should respond honestly and authentically to reflect their true opinions. They were encouraged to ask for assistance if they had any doubts regarding the instructions or the clarity of a particular item. The administration took about 5 min on average.

2.3.3. Measures

Class Cohesion. The Youth Sport Environment Questionnaire [YSEQ; 6] was used to measure class cohesion. The instrument comprises 18 items: eight for task cohesion (e.g., "I like the way we work together as a class"), eight for social cohesion (e.g., "I invite my classmates to do things with me"), and two spurious negatively worded items added to detect invalid response sets (e.g., "I do not get along with the members of my class").

All items were scored on a 9-point Likert-type scale, from 1 (Totally Disagree) to 9 (Totally Agree), with higher scores reflecting stronger perceptions of class cohesion.

Various studies have demonstrated the YSEQ's adequate reliability and validity [15,16,33], reporting acceptable ($\alpha = 0.70$) to excellent ($\alpha = 0.90$) levels of internal consistency. In this study, a Cronbach's alpha of $\alpha = 0.94$ was obtained for all YSEQ items. Values were considered excellent since $\alpha = 0.91$ for the task cohesion dimension, and $\alpha = 0.92$ for social cohesion.

Social Affiliation. To verify the concurrent validity of the YSEQ, baseline scores from the 7-item social affiliation subscale of the Social Motivational Orientations in Sport Scale (SMOSS) [34] were used. Social affiliation, as one of the key social orientations within groups, reflects members' desire to build and maintain relationships, seeking a sense of belonging and mutual recognition. This need for affiliation is often linked to the broader construct of social cohesion, which is described as the "total field of forces which act on members to remain in the group" [35]. As group cohesion strengthens, members' willingness to engage in affiliative behaviors, such as forming close ties and maintaining social unity, increases [22]. Both social cohesion and affiliation are emergent states influenced by environmental factors like motivational climate [36], making the positive correlation between cohesion and affiliation a central element in understanding group dynamics [37].

The social affiliation subscale of the SMOSS consists of seven items (e.g., "I make some good friends in class") designed to evaluate students' concerns with developing reciprocal and positive relationships within the group context of their PE classes. Each item was scored on a five-point Likert-type scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Validation studies have consistently demonstrated the SMOSS's satisfactory psychometric characteristics [38–40].

2.4. Data Analysis

Statistical analyses were conducted using a combination of RStudio (version 2022.10.31) and IBM SPSS (Armonk, NY, USA) version 29.0. JASP (version 0.19.0) was used to generate the images presented.

Preliminary analyses were conducted on the data to identify evidence of non-normality, univariate and multivariate outliers, and patterns of missing data. The assumption of normality for confirmatory factor analysis was evaluated using measures of skewness and kurtosis. McDonald's omega coefficient (McDonald, 1970) was calculated to assess the internal reliability of the instrument, with values greater than 0.7 considered acceptable.

To test the factor structure of the Portuguese YSEQ, a confirmatory factor analysis (CFA) was performed using the lavaan package [41]. An exploratory factor analysis was deemed unnecessary, as an "a priori" model of the latent construct had already been proposed [42]. For the CFA, outliers were identified using Mahalanobis squared distance (D^2). Univariate normality was assessed through skewness and kurtosis tests, while multivariate distribution was assessed using Mardia's coefficient [43]. Due to the ordinal nature of data (ordinal) and the lack of multivariate normality (Mardia's coefficient = 58.21), the diagonally weighted least squares (DWLS) estimator was used [44,45]. The appropriateness of the model was evaluated using recommended goodness-of-fit indexes: the chi-square (χ^2) statistical test, the ratio of χ^2 to its degrees of freedom (χ^2/df), comparative-of-fit-index (CFI), Tucker–Lewis index (TLI), normed fit index (NFI), parsimony normed fit index (PNFI), and root mean square error of approximation (RMSEA). The χ^2 statistical test was used to assess whether there was a significant association or difference between the variables, with a p -value < 0.05 indicating that the data significantly support the validity of the instrument. Values of CFI, TLI and NFI ≥ 0.90 indicated good and adequate adjustment of the model to data [30]. A χ^2/df value less than 5 and an RMSEA value less than 0.08 were also considered indicative of sufficient fit [30,43,46].

The reliability (internal consistency) of the YSEQ was evaluated using Hancock's H [47,48], with a preferred H value exceeding 0.9 [49].

Convergent validity measures the extent to which multiple indicators of the same construct agree and was assessed by calculating the average variance extracted (AVE). An AVE value greater than 0.50 is considered adequate [30]. Discriminant validity was assessed using the heterotrait–monotrait (HTMT) ratio of correlation. This metric describes the extent to which overlapping constructs are empirically distinct from one another [30]. An HTMT value ≤ 0.85 is generally accepted as evidence of discriminant validity [43]. Concurrent validity was examined by calculating bivariate correlations between the YSEQ and the SMOSS affiliation subscale [34].

Finally, measurement invariance for the two-factor model across gender was assessed using a multigroup CFA procedure. Invariance was tested by comparing three nested models, each with progressively stricter parameter constraints: the configural model (pattern of free and fixed loadings equivalent across groups), the metric model (loading weights constrained to be equal across groups), and the scalar model (loading weights and intercepts constrained to be equal across groups) [50]. Models were compared using the $\Delta\text{CFI} \leq -0.010$ and $\Delta\text{RMSEA} \leq 0.015$ criterion [51,52]. The significance level was established at $p < 0.05$.

3. Results

3.1. Preliminary Analysis

No missing data were identified in the preliminary analysis. The translated YSEQ showed a good overall internal consistency reliability with a McDonald's Omega (ω) value of 0.95. The two subscales also showed good reliability, with $\omega = 0.90$ for task cohesion and $\omega = 0.91$ for social cohesion.

An analysis of skewness and kurtosis indicated that the data distribution was approximately univariately normal, as absolute values of skewness were lower than 3 (ranged from -2.238 to -0.493) and kurtosis values were lower than 7 (ranged from -0.596 to 2.320) [43]. However, Mardia's coefficient (96.886) was above typically accepted values, suggesting a violation of multivariate normality assumption. As a result, the DWLS estimator was employed, as it relies less on the assumption of normality and is better suited for categorical (i.e., ordinal) data [44,45,53].

3.2. Confirmatory Factor Analysis

The initial first-order model with two correlated factors presented a poor fit to the data, as indicated by χ^2/df and RMSEA values that were above recommend thresholds [$\chi^2 = 1780.16$, $p < 0.001$; $\chi^2/\text{df} = 13.284$, CFI = 0.96, TLI = 0.96, NFI = 0.96, PNFI = 0.87, RMSEA = 0.17].

To improve the model fit, post hoc model adjustments were made considering the theoretical underpinnings of each construct and implementing only the justifiable modifications [54]. Items 6 and 12 had problematic factor loadings [50], and so were eliminated. These items were originally included as spurious negative items to detect response sets, such as when a participant agrees with all statements regardless of content [55]. However, mixed items can sometimes lead to confusion and misinterpretation [56]. Examination of modification indices (MIs) suggested that items 1 and 3, and items 9 and 17 were affecting the model fit due to highly correlated errors. An inspection of item content suggested that these correlated errors were a result of similar wording. To minimize item redundancy, items 3 and 17 were removed from the model.

After these procedures, a CFA was conducted to analyze the modified model. In this reduced model, all parameter estimates were appropriate and significant. The reduced model presented a satisfactory fit to the data [$\chi^2 = 313.744$, $p < 0.001$; $\chi^2/\text{df} = 3.52$, CFI = 0.98, TLI = 0.98, NFI = 0.98, PNFI = 0.85, RMSEA = 0.07]. Hence, the final model comprised fourteen items: seven items measuring social cohesion and seven items measuring task cohesion (Figure 1). The standardized factor loadings ranged from 0.61 to 0.91 (all $p < 0.001$), showing an adequate performance of all items (see Table 1).

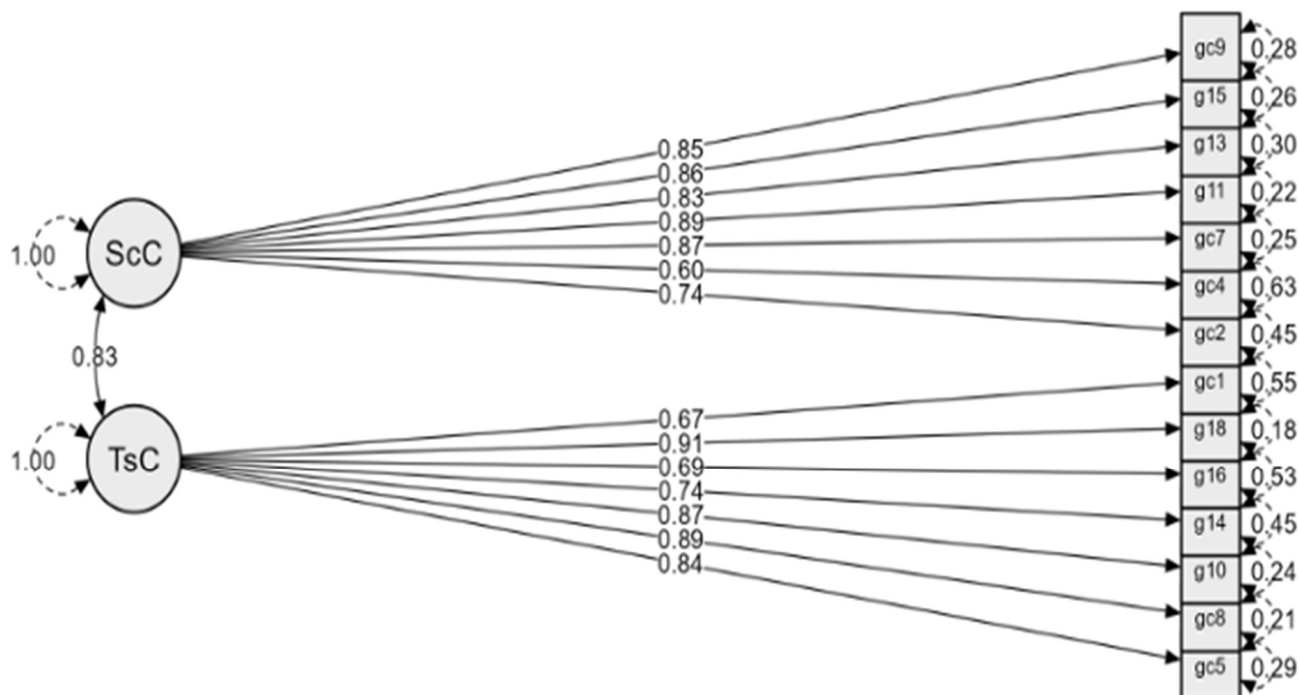


Figure 1. Re-specified model of the Portuguese version of YSEQ. Note: ScC = social cohesion; TsC = task cohesion.

Table 1. Portuguese version of YSEQ-factor loadings, Z-values, Hancock’s H (H), and average variance extracted (AVE).

YSEQ Factors/Items	Loadings	Z-Value	H	AVE
Task cohesion			0.94	0.65
1. We all share the same commitment to our class’s goals.	0.67	24.17		
5. I like the way we work together as a class.	0.84	53.00		
8. As a class, we are united.	0.89	69.08		
10. This class gives me enough opportunities to improve my own performance.	0.87	62.34		
14. I am happy with my class’s level of desire to win.	0.74	30.95		
16. My approach to playing is the same as my classmates.	0.69	26.31		
18. We like the way we work together as a class.	0.91	68.26		
Social cohesion			0.94	0.66
2. I invite my classmates to do things with me.	0.74	30.06		
4. Some of my best friends are on this class.	0.61	17.90		
7. We hang out with one another whenever possible.	0.87	62.69		
9. I contact my classmates often (phone, text message, internet).	0.85	50.86		
11. I spend time with my classmates.	0.88	64.33		
13. I am going to keep in contact with my classmates after the school ends.	0.83	51.28		
15. We stick together outside of practice.	0.86	51.79		

Hancock’s H values of 0.94 for both task cohesion and social cohesion indicate that the factor structure exhibits strong internal consistency [47,48]. Convergent validity was supported by AVE values that surpassed the recommended standard of 0.50 [57], namely 0.65 for task cohesion and 0.66 for social cohesion.

To assess discriminant validity, we followed the recommendation of Henseler et al. [58] by calculating the HTMT value. Table 2 reports that the constructs exhibited discriminant validity, with HTMT values ≤ 0.85 [43].

Table 2. Discriminant validity for the Portuguese version of YSEQ–HTMT results.

	TsC	ScC
TsC	1	
ScC	0.78	1

Note: TsC = task cohesion; ScC = social cohesion.

A multigroup CFA was performed to assess whether the reduced model was invariant across girls ($n = 265$) and boys ($n = 185$). As shown in Table 3, the baseline model's fit indices supported the hypothesis of configural measurement invariance [$\chi^2 = 411.326$, $p < 0.001$; $\chi^2/df = 2.706$, CFI = 0.939, RMSEA = 0.063], indicating that the proposed structure remains stable in both groups. The addition of model constraints led to changes in CFI and RMSEA, indicating evidence of metric invariance but not scalar invariance. Furthermore, the analysis of confidence intervals revealed differences in the initial values across groups, reinforcing the absence of scalar invariance and thereby limiting the validity of mean score comparisons between boys and girls (Table 3).

Table 3. Measurement invariance across gender.

MODEL	χ^2 (df)	χ^2/df	$\Delta\chi^2$ (Δdf)	CFI (ΔCFI)	RMSEA ($\Delta RMSEA$)	CI (90%)
Model 1 Full configural invariance	411.326 (152)	2.706	-	0.939	0.063	(0.056–0.070)
Model 2 Full metric invariance	423.745 (164)	2.584	12.419 (12)	0.939 (0.000)	0.061 (−0.002)	(0.053–0.068)
Model 3 Full scalar invariance	463.158 (178)	2.602	39.414 (14)	0.933 (−0.006)	0.061 (0.000)	(0.054–0.068)

Note: χ^2 = chi-square; df = degrees of freedom; $\Delta\chi^2$ = chi-square difference; Δdf = degrees of freedom difference; CFI = comparative fit index; ΔCFI = comparative fit index difference; RMSEA = Root Mean Square Error of Approximation; $\Delta RMSEA$ = Root Mean Square Error of Approximation difference; CI = confidence interval.

To assess concurrent validity, analyses were conducted using the two factors of the YSEQ, designated as latent factor 1 (seven items) and latent factor 2 (seven items). Two bivariate correlations were calculated: (1) between latent factor 1 and the SMOSS affiliation subscale [34], and (2) between latent factor 2 and the SMOSS affiliation subscale [34]. The results showed moderate positive correlations ($r = 0.440$ and 0.513 , respectively), suggesting acceptable concurrent validity between the measures.

4. Discussion

The main aim of this study was to develop a Portuguese version of the YSEQ and evaluate its psychometric properties within a sample of PE students. The findings offered empirical evidence of the scale's validity and reliability. Specifically, the analyses confirmed that the proposed two-factor model, social cohesion and task cohesion, demonstrated an acceptable fit to the data, along with evidence of internal consistency, convergent and divergent validity, and measurement invariance across gender. Additionally, the significant correlations between the YSEQ dimensions reinforced the construct validity of the scale, aligning with results from studies conducted in other countries [14–17,33]. For instance, Benson, Šiška, Eys, Priklerová and Slepíčka [17] demonstrated significant correlations among the dimensions of the YSEQ in Czech and Slovak youth athletes, thereby reinforcing its multidimensional nature. Similarly, Eshghi, Kordi, Memari, Ghaziasgar, Mansournia and Zamani Sani [16] confirmed the construct validity of the Farsi version of the YSEQ through significant relationships between its dimensions, further emphasizing the scale's robustness across diverse populations. Haugen, Peters, Ommundsen, Martin, Stenling and Høigaard [15] also reported substantial correlations among the YSEQ dimensions among Norwegian youth athletes, highlighting the scale's applicability in assessing group cohesion. Our results also closely correspond with those of Junior, Granja, Fortes, Freire, Oliveira

and Peixoto [14], who validated the Brazilian version of the YSEQ and reported significant correlations among its dimensions in a sample of physical education students, thereby providing evidence for its construct validity within the Brazilian PE context. Likewise, the results obtained in the present study are consistent with the research conducted by Eys, Loughead, Bray and Carron [6], which validated the YSEQ in various contexts, including PE. In this study, the researchers analyzed the structure of the YSEQ and its psychometric properties in samples of students, facilitating a deeper understanding of cohesion in school sport environments.

The final version of the scale confirmed the two constructs, task cohesion and social cohesion, but was reduced to 14 items, compared to the original 18 items of the YSEQ, while still maintaining individual reliability and fit criteria [30,46]. Two items from the original scale (items 3 and 17) were discarded due to similar wording. One of the key aspects that guided the decision to adjust the model, after examining the modification indexes, was the theoretical redundancy between certain items. Specifically, item 9 (“I contact with my teammates frequently (telephone, email, message text, internet)”) and 17 (“We contact each other frequently (phone, text message, internet)”), as well as item 1 (“We all share the same commitment to our class’s goals”) and item 3 (“As a team, we are all on the same page”), exhibited a high positive correlation between their errors. Although such correlations might be theoretically acceptable (or even expected), it rendered these items redundant. Therefore, in the interest of parsimony, items with lower factor loadings (items 17 and 3) were eliminated.

Additionally, items 6 and 12 were also excluded from the Portuguese version of the YSEQ. These items did not demonstrate sufficient factor loadings to justify their inclusion in the scale and were identified as spurious negative items. Originally, these items were included in the YSEQ to address concerns about response acquiescence and the balance of positive versus negative item wording. However, this strategy remains controversial. On one hand, it can help detect response sets where participants may agree with all statements regardless of content, thus identifying a tendency toward response acquiescence [55,59]. On the other hand, mixing positive and negative items can sometimes confuse respondents, potentially leading to misinterpretations caused by simple alterations in wording (e.g., “do” to “do not”) [56], which may, in turn, decrease internal reliability [11]. To ensure the clarity and comprehension of all questionnaire items, the two general negative items (“I do not get along with the members of my team” and “Our team does not work well together”) were excluded from the scale. This concern regarding spurious negative items was also reflected in the study of Junior, Granja, Fortes, Freire, Oliveira and Peixoto [14], who omitted them from their analysis during the validation of the YSEQ with Brazilian athletes.

Weak factorial gender invariance (configural and metric) was established, indicating that both boys and girls interpret the scale’s items in a similar manner. Therefore, the YSEQ can be reliably applied to both genders without requiring adjustments, which enhances its utility for comparative analyses between male and female adolescents [50]. However, the absence of scalar invariance limits the validity of comparing mean scores between these groups, as boys and girls may respond to the items differently in absolute terms. The analysis of confidence intervals further supports this, showing that the baseline levels differ between the groups. In summary, while boys and girls understand the items similarly in terms of the measured construct, any observed differences in their scores should not be interpreted as true differences in the underlying latent construct due to the lack of scalar invariance. In fact, gender differences can influence the measurement of underlying constructs in several ways. Male and female students may have different conceptualizations of group cohesion, which affects how they experience or interpret the items. Additionally, gender roles and cultural expectations play a significant role in shaping how male and female students respond to questions, potentially leading to distinct interpretations and response styles [60]. Both groups may also be subject to social desirability bias, but this may manifest differently due to gender norms that influence what behavior is considered “appropriate” for each group [61]. Finally, differences in emotional expression may lead

to varying responses to items, with female students being more likely to express empathy, in contrast to male students, whose emotional expression may be influenced by cultural norms that discourage such behaviors [62]. Notably, the study by Junior, Granja, Fortes, Freire, Oliveira and Peixoto [14] was the only one to evaluate the invariance of the YSEQ, and it reported model equivalence for boys and girls, even at the scalar invariance level.

Finally, the correlations established with student social affiliation [34] confirmed criterion validity. In particular, the reciprocal nature of the relationship suggests that as team cohesion improves, social affiliation also tends to increase. When individuals feel socially affiliated with their teammates, they are more likely to engage in cooperative behaviors, communicate effectively, and support each other, thereby strengthening the overall unity of the team. This enhanced cohesion, in turn, contributes to improved team performance, greater satisfaction among team members, and a higher likelihood of sustained participation in the activity [6,8]. Whether in schools, competitive sports, youth development, or professional settings, the synergy between group cohesion and social affiliation is crucial for fostering strong relationships, enhancing performance, and promoting personal well-being. In competitive sports, high team cohesion strengthens interpersonal bonds, improving communication, trust, and collaboration, which ultimately boosts performance. Social affiliation, where athletes feel supported and connected, cultivates a sense of belonging and motivates greater commitment to team success. This dynamic not only benefits performance but also contributes to the emotional and psychological well-being of participants [63,64]. Beyond competitive sports, this relationship is evident in youth settings, such as community programs, where adolescents develop social skills and identity. In environments like schools and physical education classes, cohesive groups offer support, encouraging personal growth and reducing social isolation. Similarly, in workplace teams, strong social affiliation within cohesive groups enhances job satisfaction, collaboration, and commitment, leading to more productive work environments [65]. Nevertheless, it is crucial to emphasize that the inter-correlations between the scale's factors were moderate (0.44 and 0.51), which only offers limited support for the scale's validity [66,67]. Regarding concurrent validity, Eshghi, Kordi, Memari, Ghaziasgar, Mansournia and Zamani Sani [16] was the only study to examine this aspect for the YSEQ, revealing strong negative correlations between cohesion and anxiety. Additionally, other studies have demonstrated acceptable concurrent validity between similar measures, with results comparable to those observed in the present study [68,69]. One of the main challenges in assessing concurrent validity for questionnaire-based measures lies in the absence of widely accepted gold standards. Indeed, some of the existing benchmarks may themselves fall short in accurately capturing the phenomena under investigation [70].

Limitations and Future Directions

This study has both strengths and limitations that should be considered when interpreting the results. One of its key strengths is the meticulous approach taken in translating and adapting the scale, ensuring that the final Portuguese version was appropriate for Portuguese speakers. Specifically, the process involved collaboration with content experts (academics specializing in sport psychology), experienced translators, and a sample of youth participants to ensure that the content validity of the original scale was maintained in the Portuguese adaptation. This rigorous approach, emphasizing content validity, is particularly noteworthy, as Gunnell et al. [71] pointed out that content validity is often overlooked in scale adaptations within the sport and exercise psychology literature. Consequently, we are confident that the Portuguese version of the YSEQ is consistent with the original and comprehensible to the Portuguese-speaking population. Another strength of this study is the establishment of criterion validity, specifically concurrent validity. Scientific literature recommends comparing new measures with existing measurement tools [70], yet many studies tend to overlook this comparison and acknowledge it as a limitation [14,15].

One limitation of our study is that, although our sample meets several recommendations for conducting a CFA, we recognize that the prevailing scientific consensus suggests

a larger sample size is generally preferable, as it is more likely to produce generalizable and replicable results [72]. While the current sample was suitable for the study's objectives, a more extensive sample could better represent the Portuguese population, thereby enhancing the generalizability of the findings. Additionally, the geographical distribution of participants, all from the northern region of Portugal, presents another limitation. Future research should aim to examine the scale's properties across Portuguese-speaking students from various regions to achieve a more comprehensive understanding. Moreover, future studies could investigate the scale's invariance across different age groups (children, adolescents, and adults) to assess its applicability throughout the lifespan.

As the first validated instrument for Portuguese PE students, further research is needed to reinforce its validity, reliability, and overall effectiveness. Although our study demonstrates acceptable values for concurrent validity, the evidence remains somewhat limited due to the moderate strength of the observed correlations. Therefore, further examination of criterion validity, with a particular focus on establishing predictive validity, is crucial for assessing the scale's overall quality and robustness. Additionally, we underscore the need for validation studies not only within the Portuguese context but also across diverse linguistic and cultural environments.

Finally, the study's cross-sectional design does not offer insights into whether students' perceptions of group cohesion fluctuate over time in response to various events throughout the school year. Future research could address this gap by assessing the temporal stability of these cohesion dimensions. Longitudinal designs would provide deeper insights into how group cohesion evolves over time.

5. Conclusions

The main conclusion derived from the present study is that the Portuguese version of the YSEQ is a valid, reliable, suitable, and comprehensive instrument for measuring group cohesion within the school context.

As far as we are aware, this study is the first to present psychometric validation for an instrument that assesses both task and social cohesion in sports participation, adapted to a language other than English, specifically for use within the Portuguese school setting.

Measuring group cohesion through instruments like the YSEQ not only contributes to a more positive PE experience but also supports students' overall personal, social, and academic development.

6. Practical Implications

The evaluation of group cohesion in PE classes is essential for fostering a positive and supportive learning environment, which enhances students' sense of belonging and motivates active participation. A cohesive group promotes collaboration, strengthens interpersonal skills, such as communication, empathy, and conflict resolution, and minimizes exclusion and disruptive behaviors. These factors contribute to a more inclusive and productive classroom atmosphere, benefiting both students' social and emotional development.

By measuring group cohesion, the YSEQ allows educators to gain a deeper understanding of group dynamics and the factors influencing students' interactions within the PE context, including testing and estimating the relationship between these factors. The validated Portuguese version of the YSEQ is a reliable, valuable, and useful tool for schools, teachers, researchers, and sports psychologists to assess group cohesion, identify areas where group dynamics may affect participation and engagement in physical activities, and develop and evaluate intervention programs aimed at enhancing group cohesion in middle and secondary PE classes.

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