


# Validation of the Sport Motivation Scale-II: Implications for the Portuguese Youth Sport System

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## Abstract

Based on the tenets of self-determination theory, the Sport Motivation Scale-II is an 18-item instrument that consists of six subscales. Despite the numerous studies that have been conducted using self-determination theory in organized youth sport contexts, measures available to assess self-determined forms of motivation across socio-cultural contexts are scarce. This is particularly important because there are socio-cultural contexts that have diverse reward systems, competitive structures, and convey different social norms, values, and cultural nuances. The existence of measures available to assess self-determined forms of motivation across socio-cultural contexts may enable the development of a robust knowledge base that informs research-to-practice partnerships and potential changes across a complex youth sport landscape. The present study aimed to validate the factor structure of the Sport Motivation Scale-II with a sample of 239 Portuguese adolescent athletes. The participants' ages ranged between 12 and 17 years old ( $M = 14.39$ ;  $SD = 1.35$ ). Confirmatory factor analysis was conducted to achieve the aim of this study. Findings showed that the six-factor model used by the authors presents a good adjustment concerning sports participants' level of motivation toward sports practice. Moving forward, the Sport Motivation Scale-II may be used in future studies to help provide an understanding about athletes' self-determination. Several practical and theoretical implications are provided.

## Plain Language Summary

Based on the tenets of self-determination theory, the Sport Motivation Scale-II is an 18-item instrument that consists of six subscales. Despite the numerous studies that have been conducted using self-determination theory in organized youth sport contexts, measures available to assess self-determined forms of motivation across socio-cultural contexts are scarce. This is particularly important because there are socio-cultural contexts that have diverse reward systems, competitive structures, and convey different social norms, values, and cultural nuances. The existence of measures available to assess self-determined forms of motivation across socio-cultural contexts may enable the development of a robust knowledge base that informs research-to-practice partnerships and potential changes across a complex youth sport landscape. The present study aimed to validate the factor structure of the Sport Motivation Scale-II with a sample of 239 Portuguese adolescent athletes.

## Keywords

amotivation, self-determination, confirmatory factor analysis, sport, youth

Consider an athlete who engaged in sport activities for a couple of months and tried to learn a range of sport skills. However, this athlete lacks the necessary self-determination to engage in these sport activities for a long period of time. This is the case for many athletes across the globe. Engagement in organized youth sport, physical education, and other forms of physical activity does not automatically lead to intrinsically motivated youth participants who appreciate and prioritize these types of activities (Bryan & Solmon, 2012). Further, organized youth

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sport does not always generate holistic youth development outcomes such as physical fitness, psychosocial skill development, or improved cognitive skills (Cairney et al., 2019; De Meester et al., 2017). To offer new conceptualizations about holistic youth development, there have been numerous campaigns emphasizing the importance of organized youth sport in fostering physical, but also mental health (Bull et al., 2020; Swann et al., 2018). Organized youth sport needs to be deliberately and carefully structured to induce positive outcomes (Bruner et al., 2021). Specifically, to have intrinsically motivated youth participants as well as foster prolonged engagement in sport activities and holistic youth development there is the need to reflect on the factors that contribute to these outcomes.

The strategies used by youth sport coaches and other meaningful adults, and their ability to create an adequate motivational climate are associated to motivation for sports practice and, subsequently, prolonged engagement in sport activities (Alvarez et al., 2012; Haugen et al., 2020). An adequate motivational climate is dependent on self-determination (Escriva-Boulley et al., 2018; White et al., 2021). Self-determination (Deci & Ryan, 1975, 1985, 2000, 2002) can be defined as an individual's ability to engage in a behavior or action due to a personal commitment to do so. For example, athletes may join a sport organization because they want to learn new skills, understand the importance of being physically active, and see value in engaging with peers. Conversely, athletes may simply engage in sport activities because their parents required them to do so and see no personal value in these experiences.

### **Self-Determination Theory: Lenses for Conceptualizing Motivation Across Youth Sport Contexts**

To foster self-determination in youth athletes is to reflect on the key purpose and mission of organized youth sport. Thus, the ultimate objective of organized youth sport is to provide a firm foundation for young people to become self-determined and engage in a variety of physical activities, as well as to instill a desire for physical activity in their daily routines for the rest of their lives (Gill et al., 2013). Hence, self-determination Theory (SDT; Deci & Ryan, 1985) has been extensively used as an overarching framework to study and understand motivation, especially to map the various levels and forms of motivation toward a range of activities. SDT facilitates a thorough examination about how an individual (e.g., coach, teacher) may foster self-determination and ensure long-lasting physical activity behaviors throughout the life span (Calvo et al., 2010; White et al.,

2021). Within SDT, there are several needs, which we will outline below, that are considered pivotal for individuals to become self-determined and more able to change their behaviors (Pelletier et al., 2013). As such, these needs contribute to behavior change, greater well-being, and personal development (Ryan & Deci, 2017).

SDT uses a continuum that includes several factors that aim to explain greater and lesser self-determined forms of motivation (Ryan & Deci, 2007, 2017). Specifically, on one end of the continuum, (1) amotivation is postulated as a lack of will to engage in a behavior/activity; (2) external regulation relates to individuals' ability to engage in a behavior/activity due to rewards or fear of punishment; (3) introjected regulation refers to internal desires and rewards; (4) identified regulation refers to the importance given to a behavior/activity; (5) integrated regulation highlights a personal need to engage in a behavior/activity; and (6) intrinsic motivation, which is the last part of the continuum, refers to one's will, personal interest, and a need to continuously engage in a behavior/activity (Hagger & Chatzisarantis, 2007a, 2007b). *All these factors reflect a fluid set of motivation forms through which individuals navigate* (Hagger & Chatzisarantis, 2007a; Harwood et al., 2015; Hastie et al., 2013; Kirk, 2006; Ryan & Deci, 2017). *This continuum is dependent on three mediating variables:* (a) perceived relatedness which refers to the quality of the relationships established in a setting (e.g., quality of the coach-athlete relationship); (b) perceived competence that alludes to how one perceives their competence in a task or activity (e.g., perceived skill level in a sport), and (c) autonomy that reflects a climate where choices and voices are provided to participants, as well as active participation is valued and fostered (e.g., creating for athletes to have choices and foster their engagement).

### **The Present Study**

Despite the numerous studies that have been conducted using SDT in organized youth sport contexts (White, 2021), measures available to assess self-determination across socio-cultural contexts are scarce. This is particularly important because there are socio-cultural contexts that have diverse reward systems, competitive structures, and convey different social norms, values, and cultural nuances. It should be noted most studies have been conducted across English-speaking countries (Harwood et al., 2015; Hastie et al., 2013; Kirk, 2006) which, inherently, places other cultures and sport systems in a more fragile position to develop evidence-based practices and instigate positive change. The existence of measures available to assess self-determined forms of motivation across socio-cultural contexts may enable the

development of a robust knowledge base that informs research-to-practice partnerships (e.g., Holt et al., 2018a, 2018b) and potential changes across a complex youth sport landscape (e.g., Dorsch et al., 2022).

With this research gap in mind, the purpose of the present study is to validate the Sport Motivation Scale (SMS-II; Pelletier et al., 2013) to the Portuguese context with a sample of adolescent athletes (Junior et al., 2014; Pineda-Espejel et al., 2016). Based on a preliminary attempt made by Rodrigues et al. (2021), this study aims to (a) assess the SMS-II's psychometric properties and (b) test the level of adjustment concerning the variable "gender." Rodrigues' et al. (2021) preliminary attempt included adult athletes. We aim to extend this validation and consider a sample of adolescent athletes because they are at a critical developmental stage whereas organized youth sport should provide just and meaningful opportunities for self-determined forms of motivation to emerge (Telama et al., 2006; Torres & Frías 2023). This is also particularly important due to the fact that Portuguese youth sport has been considered a performance-centered climate (Camiré & Santos, 2019; Santos et al., 2023), specifically a pathway for negative sport experiences that include discrimination (Nery et al., 2019). Therefore, this study will allow for the continued development of the SMS-II which may have numerous applications across youth sports contexts.

## Methods

### Participants

In total, 239 Portuguese adolescent athletes (132 males and 107 females), aged 12 to 17 years ( $M = 14.39$ ;  $SD = 1.35$ ), participated in the study. These athletes practiced various sports (i.e., handball, athletics, basketball, football, swimming, and volleyball), as well as received primary and secondary education in five schools at the northern and central part of Portugal. These athletes lived in urban areas across five districts. The mean age of our sample was lower than Pelletier's et al. (2013) ( $M = 17.41$ ;  $SD = 1.77$ ). The inclusion criteria were as follows: (a) athletes who actively and frequently participated in youth sport competitive events (i.e., had at least two training sessions and one competitive event per week); and (b) having at least 2 years of competitive experience (the participants had an average competitive experience of 3.46 years;  $DP = 1.27$ ). We tried to use criteria similar to those used by Pelletier et al. (2013) in their original study.

## Measures

**Sport Motivation Scale-II (SMS-II).** Based on SDT, Pelletier's et al. (2013) developed the SMS-II to evaluate the motivation level of individuals who practice sports. The SMS-II consists of 18 items associated to six subscales that measure the motivational regulations per the self-determination continuum: (1) amotivation (e.g., "I used to have good reasons for doing sports, but now I am asking myself if I should continue"); (2) external regulation (e.g., "Because people I care about would be upset with me if I didn't"); (3) introjected regulation (e.g., "Because people I care about would be upset with me if I didn't"); (4) identified regulation (e.g., "Because I have chosen this sport as a way to develop myself"); (5) integrated regulation (e.g., "Because practicing reflects the essence of who I am"); and (6) intrinsic motivation (e.g., "Because it gives me pleasure to learn more about my sport"). Athletes were asked to rate on a Likert scale the extent to which the motivations presented to practice sports aligned with their personal motives. Motivation was assessed using a 7-point Likert scale ranging from 1 (do not agree at all) to 7 (totally agree). The authors showed the SMS-II was satisfactorily reliable and valid. Cronbach's alpha values were always greater than .73 for the different factors, as well as the confirmatory factor analysis (CFA) revealed an acceptable fit of the model ( $\chi^2(120, N = 206) = 231.88, p < .001$ ; RMSEA = .06; RMSEA 90% CI = .04-.06; CFI = 0.94; NFI = 0.90; and TLI = 0.92). The SMS-II is a valid measure across different studies and socio-cultural contexts such as Brazil, Canada, China, France, Hungary, Mexico, and Spain (Granero-Gallegos et al., 2018; Li et al., 2016; Nascimento et al., 2014; Pelletier et al., 2013, 2019; Pineda-Espejel et al., 2016; Smohai et al., 2021; Viciano et al., 2017).

**Sport Participation Survey.** Through a survey, data were collected regarding athletes' age, gender, and extracurricular sport activities. This survey assessed the type of sport practiced, number of years in which they regularly participated in competitions, as well as number of training sessions, and weekly competitions.

### Procedure

Ethical approval was obtained through the Ministry of Education (Office of Statistics and Educational Planning) before undertaking this research. This procedure follows the current law in Portugal. Because athletes were recruited via schools, school administrators

were contacted via telephone and informed about the aims and implications of the study. The athletes' parents were also informed. After obtaining written and verbal informed consent from the school administrators, athletes, and their parents data collection was conducted. The participants were told that they were under no obligation to answer any of the questions if they did not feel comfortable doing so and that they could withdraw from the study at any time. The participants were also assured that their responses would be kept confidential, and this study was not part of any assessment. The surveys were completed during the initial or final part of a physical education class, with at least one of the researchers present to clarify any questions. The survey also included information on the purpose of the study and provided instructions for participants. The participants took approximately 15 min to answer the questions.

### Translation

After obtaining permission from the principal investigator who developed the SMS-II, the measure was translated using the "back-translation" method. This is the most widely used method in the social sciences for verifying the accuracy of the translation for scales and surveys (Douglas & Craig, 2007). We requested two university teachers who were fluent in English to translate the survey into Portuguese; then, we compared these two translations and found no differences. The final Portuguese version was then translated back into English by another university professor. *The original version of the measure was compared with the final English-translated version; there were no differences between the two, thus the questionnaire was deemed adequate.* The first version was administered to a group of 20 adolescent athletes to see if all the items were clear and suitable. No major questions were raised.

### Data Analysis

The psychometric properties of the SMS-II were analyzed through the Analysis of Moment Structures (AMOS) software, Version 24. In the initial phase, the skewness and kurtosis coefficients were examined along with the Mardia (1970) coefficient to examine the univariate and multivariate normality of the distribution of item values, respectively. In univariate normality, items with asymmetry values of higher than 3 ( $Sk$ , with  $|Sk| > 3$ ) and kurtosis values of higher than 10 ( $Ku$ , with  $|Ku| > 10$ ) are considered to have sensitivity problems (Kline, 2016). The existence of multivariate normality in the data is adequate when the Mardia (1970) coefficient is lower than  $p(p + 2)$ , where  $p$  is the number of variables observed (Bollen, 1989). We also attempted to

verify the presence of outliers using the squared distance of Mahalanobis ( $D^2$ ; Kline, 2016).

CFA was performed using the maximum likelihood method to verify the adequacy of the Portuguese version of the SMS-II in terms of the factor structure as proposed by the original authors (Pelletier et al., 2013). To evaluate the quality of the global adjustment of the proposed factor model, the following indexes were used: (a) the ratio between  $\chi^2$  and the number of degrees of freedom ( $\chi^2/df$ ); (b) the comparative fit index (CFI; Hu & Bentler, 1999); (c) the Tucker-Lewis Index (TLI; Tucker & Lewis, 1973); (d) the root mean square error of approximation (RMSEA; Hooper et al., 2008); and (e) the chi-square and the standardized root mean square residual (SRMR; Hu & Bentler, 1999). The model was considered to have an acceptable adjustment when the following values were recorded:  $\chi^2/df < 5$ ; CFI  $> 0.90$ ; TLI  $> 0.90$ ; RMSEA  $< .08$ ; SRMR  $< 0.08$  (Byrne, 2010; Hooper et al., 2008; Hu & Bentler, 1999; Kline, 2016).

The construct reliability was estimated using individual ( $\lambda^2$ ) and composite (FC) reliabilities. For convergent validity, the average variance extracted (AVE) was calculated for each of the factors with a cut-off point of 0.5 (Hair et al., 2019). The discriminant validity of the factors was assessed by comparing the squares with the correlation squares between them. For nomological validity, Pearson's correlational analyses were conducted to determine the existence of a simplex-like pattern between subscales to ensure the presence of the variables of the SDT continuum. To examine the invariance of the factor structure for female and male athletes, a multi-group analysis was conducted. Model invariance was conducted by comparing the free model (i.e., factor weights and variances/covariances of free factors) with the constrained model (i.e., factor weights and variances/covariances of the groups). The chi-square value ( $\chi^2$ ) and degrees of freedom were used to verify whether there were possible differences between the models (Kline, 2016).

## Results

### Preliminary Analyses

Table 1 shows the means and standard deviations of the six subscales that comprise the SMS-II. Preliminary analysis showed that none of the 18 items had asymmetry and kurtosis values that, according to Marôco (2014), suggested *significant deviations from the normal distribution* ( $|Sk| > 3$  and  $|Ku| > 10$ ). Regarding multivariate normality, it was found that the Mardia coefficient was 10.3, a value that, from the perspective of Bollen (1989), is lower than  $p(p + 2)$ , where  $p$  is the number of variables observed.

**Table 1.** Average Standard Deviation Recorded in the Dimensions of SMS-II.

Dimensions	Boys	Girls	Total
Amotivation	2.78 ( $\pm$ 1.86)	2.18 ( $\pm$ 1.43)	2.51 ( $\pm$ 1.70)
External regulation	3.21 ( $\pm$ 1.98)	2.53 ( $\pm$ 1.49)	2.91 ( $\pm$ 1.81)
Introjected regulation	4.41 ( $\pm$ 1.42)	4.00 ( $\pm$ 1.09)	4.23 ( $\pm$ 1.29)
Regulation identified	5.79 ( $\pm$ 1.42)	6.04 ( $\pm$ 1.18)	5.91 ( $\pm$ 1.32)
Integrated regulation	5.71 ( $\pm$ 1.40)	5.99 ( $\pm$ 1.71)	5.84 ( $\pm$ 1.31)
Intrinsic motivation	5.65 ( $\pm$ 1.42)	5.74 ( $\pm$ 1.13)	5.69 ( $\pm$ 1.30)

**Table 2.** Standardized Factorial Weights, Individual Item Reliability, and Composite Reliability of the SMS-II Dimensions.

Factors	Item	$\Lambda$	$\lambda^2$	FC
Intrinsic regulation	3	0.71	0.50	0.77
	9	0.65	0.43	
	17	0.61	0.37	
Integrated regulation	4	0.67	0.46	0.74
	11	0.70	0.49	
	14	0.79	0.62	
Regulation identified	6	0.83	0.70	0.82
	12	0.71	0.50	
	18	0.73	0.54	
Introjected regulation	1	0.66	0.44	0.63
	7	0.43	0.18	
	16	0.56	0.31	
External regulation	5	0.65	0.43	0.81
	8	0.68	0.47	
	15	0.77	0.59	
Amotivation	2	0.81	0.65	0.78
	10	0.71	0.50	
	13	0.68	0.46	

Note.  $\lambda$  = standardized factorial weight;  $\lambda^2$  = individual item fidelity; FC = composite reliability.

### Construct Validity and Reliability

CFA showed an unsatisfactory adjustment quality ( $\chi^2(239) = 443.07$ ;  $p < .001$ ;  $\chi^2/df = 3.82$ ; CFI = 0.90; TLI = 0.87; RMSEA = .10; SRMR = 0.09). Therefore, attempts were made to improve the model's adjustment quality by first eliminating 21 observations whose  $D2$  values were revealed to be outliers ( $p1$  and  $p2 < .001$ ). Subsequently, efforts were employed to include trajectories between the pair residuals of items that included the same factor, namely, 3 and 17 (intrinsic motivation), 6 and 12 (identified regulation), 7 and 16 (introjected regulation), and 2 and 13 (amotivation). After these changes, the six-factor model showed adequate goodness of fit ( $\chi^2(239) = 264.19$ ;  $p < .001$ ;  $\chi^2/df = 2.61$ ; CFI = 0.95; TLI = 0.93; RMSEA = .06; SRMR = 0.05). The quality of the adjustments found in this study were identical to those found in the original model (Pelletier et al., 2013).

Data on standardized factorial weights ( $\lambda$ ), individual reliability of items ( $\lambda^2$ ), and composite reliability (FC)

are presented in Table 2. All items have factor weights greater than 0.50, a value considered acceptable in past research (Hair et al., 2019) and which indicates factor validity. Only item 7 of the "introjected regulation" factor shows a value lower than 0.43. However, we maintained this item in the model because the factorial value was above 0.40, which is deemed acceptable (Hair et al., 2019). The SMS-II subscales showed adequate composite reliability ( $>0.70$ ). Therefore, these values were adequate for all factors (amotivation = 0.78; external regulation = 0.81; identified regulation = 0.82; integrated regulation = 0.74; intrinsic regulation = 0.77), except for introjected regulation (0.63).

### Convergent and Discriminant Validity and Correlational Analysis

Table 3 highlights that five of the SMS-II subscales show high values of convergent validity (AVE  $> .50$ ). However, "introjected regulation" (AVE = .36) shows

**Table 3.** Correlations and Average Variance Extracted.

Subscale	1	2	3	4	5	6	AVE
1. Amotivation	1						.57
2. External regulation	.46**	1					.59
3. Introjected regulation	.35**	.53**	1				.36
4. Identified regulation	-.21**	-.15*	.19*	1			.62
5. Integrated regulation	-.34**	-.24**	.27**	.76**	1		.50
6. Intrinsic regulation	-.38**	-.21**	.30**	.74**	.73**	1	.54

Note. \* $p < .05$ ; \*\* $p < .01$ ; AVE = average variance extracted.

**Table 4.** Multigroup Analysis According to Gender.

Final model	GL	CMIN	$p$
Factorial weights	24	52.82	.001
Structural covariance	42	71.19	.073
Average	88	99.45	.196

more fragile values. Concerning discriminant validity, the correlation between the factors is lower than the AVE values of each factor. The correlation matrix reveals the existence of a simplex-like pattern that is consistent with the SMS-II. The self-determined regulations are positively correlated among themselves but negatively correlated with the non-self-determined regulations.

### Invariance According to Gender

Using a multigroup analysis, we also tried to analyze the existence of variations in the factor structure of the model according to gender. Model invariance was examined by comparing the free model with the constrained model. Per Table 4, the results obtained through the chi-square test show that the model with fixed factor weights (constrained) has a significantly lower adjustment than the free model ( $\chi^2 \text{ dif}(24) = 52.82, p = .001$ ). However, there were no significant differences between the model with fixed structural coefficients and the model with free structural coefficients ( $\chi^2 \text{ dif}(42) = 71.19, p = .073$ ) which highlights the existence of invariance. There were no significant differences between the averages of female and male athletes ( $\chi^2 \text{ dif}(88) = 99.45, p = .196$ ).

Findings showed that model variance referred only to the factor weights of some items. Performing a Z test on the equality of structural coefficients showed there were statistically significant differences in the coefficients for the following trajectories: (a) item 3 (intrinsic motivation) ( $Z = -2.01; p = .05$ ); (b) item 14 (integrated regulation) ( $Z = -1.99; p = .05$ ); (c) item 16 (introjected regulation) ( $Z = -2.51; p = .01$ ); (d) item 5 (external regulation) ( $Z = -3.69; p = .000$ ); (e) item 8 (external

regulation) ( $Z = -3.39; p = .001$ ); and (f) item 2 (amotivation) ( $Z = -2.08; p = .038$ ). The final model seems to be equivalent for female and male athletes, despite the factor weights of several items indicating variance between the two groups.

### Discussion

The purpose of the present study is to validate the SMS-II to the Portuguese context with a sample of adolescent athletes. The Portuguese version, as the original measure, included 18 items that assessed the six forms of motivation proposed by SDT. Our results support a six-factor structure. The procedures used such as the elimination of outlier observations and the correlation between measurement errors of items that were part of the same factor showed the presence of a six-factor model with a good adjustment quality. Our indicators of adjustment quality were similar to those observed by Pelletier et al. (2013). Composite reliability, convergent validity, and discriminant validity were also adequate. However, the factor “introjected regulation” showed weak composite reliability and AVE which supports the findings from previous studies (Granero-Gallegos et al., 2018; Li et al., 2016; Nascimento Junior et al., 2014; Pelletier et al., 2019; Pineda-Espejel et al., 2016; Smohai et al., 2021).

Gender invariance analysis showed that the structure of the six-factor model was generally equivalent for both female and male athletes which supports previous studies that have indicated the SMS-II has a good adjustment quality for gender (e.g., Rodrigues et al., 2021; Viciano et al., 2017). Findings also showed that autonomous regulations were positively correlated among themselves. Conversely, controlled regulations were negatively associated with global autonomous regulations. Overall, these findings were consistent with the simplex-like pattern observed in the studies conducted by Pelletier et al. (2013, 2019). The only finding that contradicts the principles and notions conveyed within SDT refer to intrinsic motivation which shows a stronger correlation with integrated regulation rather than with identified regulation. The present study supports the reliability and validity of

the Portuguese version of the SMS-II which can help assess self-determined forms of motivation across the organized youth sport landscape.

## Practical and Theoretical Implications

In Portugal (as in other countries), physical activity levels have decreased substantially over the last years (Mota et al., 2018), as well as negative sport experiences amongst youth have increased, including episodes of bullying (e.g., Nery et al., 2019). These factors have made researchers develop resources (e.g., novel measures, innovative research protocols) to understand how to create better sport experiences for youth and increase self-determined forms of motivation. Taken together, these efforts have been employed to help mitigate negative outcomes such as the ones outline at the onset of this section. Considering these contextual factors, the SMS-II has the potential to be used within the Portuguese youth sport landscape in diverse ways. These recommendations may also instigate discussions and reflections across other socio-cultural contexts.

First, researchers may use the SMS-II to diagnose athletes' motivations across a range of coaching contexts (e.g., competitive, recreational) with the aim of understanding youth sport coaches' effectiveness in developing strategies that contribute toward *perceived relatedness*, *perceived competence*, and *the creation of an autonomy climate*. These three factors are critical to increase sport participation rates, as well as provide meaningful sport experiences. Additionally, it is also important to acknowledge that, beyond the coach, a multitude of actors contribute to the emergence of self-determined forms of motivation such as parents and sport administrators. The youth sport system is indeed influenced by several social and cultural forces (e.g., reward systems, organizational values, social norms) that determine how performance, development, and motivation are positioned (Dorsch et al., 2022). Second, researchers and practitioners may also need to reflect on *why* specific forms of motivation are more prevalent in certain coaching contexts and prompt discussions around the value system in place. To better examine and understand trends concerning motivation toward youth sport participation, researchers may need to delve into other fields and disciplines such as sport sociology and social work to understand the pitfalls of the current youth sport system (Santos, 2022). For instance, through the lenses of social justice, it is possible to reflect about how the current gender inequities across Europe (Emmonds et al., 2023) may have a relationship with female athletes' motivation toward sport. Subsequently, youth sport organizations may need to invest more time and effort in supporting self-determined forms of motivation amongst

female athletes. Third, coach education offerings may be strategically used to help youth sport coaches develop strategies and novel pedagogical approaches that contribute to self-determined forms of motivation. Indeed, the SMS-II can be used as an applied resource to help set objectives and contents for coach education programs across Portugal. However, within the Portuguese landscape, research has shown that most coach education offerings are centered around performance which may hinder coaches' effectiveness toward inducing self-determined forms of motivation (Santos et al., 2023).

Finally, policy makers may need to focus on the outputs derived from the SMS-II to evaluate and fund youth sport organizations. Simply assessing youth sport organizations' effectiveness through the number of participants in a given sport may have numerous limitations. One of the main limitations is the fact that some sports may never have a high number of participants. For example, football in Portugal is the only sport above the 200,000 participants mark (Carvalho, 2022). However, despite having much less participants, rowing coaches may be developing positive strategies that lead to self-determined forms of motivation. In other words, policy makers, with the help of researchers, may need to carefully tailor sport policies and funding requirements to meet the standards for expected behaviors and practices concerning motivation (Whitley et al., 2020). Moving forward, the SMS-II can be of value both from a practical and theoretical standpoint and influence youth sport organizations' practices, as well as research programs.

## Conclusions

This study investigated the psychometric properties of the SMS-II based on the validation study conducted by Rodrigues et al. (2021). There are a few limitations that need to be acknowledged: (i) this is a cross-sectional cohort study; and (ii) convenience sampling was used and only a part of the Portuguese territory was covered. These limitations limit the generalizability of the results. Therefore, researchers should further examine the psychometric properties of the SMS-II. Future research should utilize a larger and randomly selected sample that is more heterogeneous in terms of participants' ages, ethnicities, sports, and backgrounds. *It is also important to understand why the factor "introjected regulation" has such a low composite reliability and AVE which is an issue that requires further attention.* Finally, future studies could use the SMS-II to understand youth's motivation across organized youth sport and subsequently inform coach education programs, policy changes and instigate reflections on how to develop novel strategies for coaching practice. This is our humble challenge for researchers across the Portuguese youth sport system and

elsewhere—examine athletes' experiences and reflect on how to better structure organize youth sport in a complex post-pandemic landscape.

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### Declaration of Conflicting Interests

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.


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### Ethical Approval

The studies involving human participants were reviewed and approved by the Portuguese Ministry of Education (Office of Statistics and Education Planning). Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

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### Data Availability Statement

The dataset generated during the current study is available from the corresponding author on reasonable request.

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