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Exploring the factorial structure of the Sport Anxiety Scale-2: Invariance across language, gender, age and type of sport

Yago Ramis[1], Carme Viladrich[1], Catarina Sousa[1] and Caroline Jannes[2]
[1] Universitat Autònoma de Barcelona and [2] Ghent University

Abstract

Background: This study evaluates the metric and scalar invariance of the Sport Anxiety Scale-2 (SAS-2), which is considered one of the best sport performance anxiety assessment tools for child and adolescent athletes, across four sampling variables: language, gender, age and type of sport. **Method:** The participants were 842 athletes (Mage = 11.73, SD = 2.20) from Spain, Belgium and Portugal, each of whom completed the language-adapted version of the SAS-2. Confirmatory factor analysis was used to test the invariance of the measurement model, and the relative importance of the sampling variables was assessed using a multiple indicator multiple causes model (MIMIC). **Results:** The results revealed metric and scalar invariance across all sampling variables and null to modest effects of gender, age and type of sport as covariates for the factors of the SAS-2. However, there was a marked effect (ß = -.56) of language on worry, which reflected lower scores on this factor for the Flemish sample. **Conclusions:** The results of this study provide evidence of the invariance of the SAS-2 across samples, thereby endorsing the reliability of its factorial structure for future multi-group research.

Keywords: Anxiety, youth sport, CFA, MIMIC.

Resumen

Exploración de la estructura factorial de la Escala de Ansiedad Competitiva SAS-2: invariancia a través de lenguaje, género, edad y tipo de deporte. **Antecedentes:** este estudio evalúa la invariancia métrica y escalar de la Escala de Ansiedad Competitiva-2 (SAS-2), considerada una de las mejores herramientas de evaluación de la ansiedad competitiva en niños y adolescentes, a través de cuatro variables muestrales: lenguaje, género, edad y tipo de deporte. **Método:** los participantes fueron 842 deportistas (Medad = 11.73; DE = 2.20) de España, Bélgica y Portugal, que completaron la versión adaptada del SAS-2. Se utilizó un análisis factorial confirmatorio para analizar la invariancia del modelo de medida y se llevó a cabo un modelo de múltiples indicadores y múltiples causas (MIMIC) para evaluar la importancia relativa de las variables muestrales. **Resultados:** los resultados revelaron invariancia métrica y escalar a través de todas las variables muestrales y efectos nulos o moderados de género, edad y tipo de deporte como covariables de los factores del SAS-2. Sin embargo, se detectó un efecto notable (ß = -.56) del lenguaje sobre la preocupación, reflejando niveles menores de este factor en la versión flamenca. **Conclusiones:** los resultados de este estudio proporcionan pruebas de la invariancia del SAS-2 entre muestras, certificando la fiabilidad de su estructura factorial para futuras investigaciones multigrupo.

Palabras clave: ansiedad, deporte de iniciación, CFA, MIMIC.

In the environment of sports and sports competition, recreational and social evaluative aspects are simultaneously present (e.g., Miller, 2012). This characteristic makes competitive situations potentially anxiogenic, particularly for children, who have yet to develop an established repertoire of coping strategies. Consequently, anxiety is one of the most frequently studied topics in sports psychology and continues to be a major focus of investigation for researchers and consultants worldwide (e.g., Woodman & Hardy, 2003).

Competitive anxiety is defined as sport-specific trait anxiety that regularly appears before or during competition (Martens, 1977). This context-specific approach complements the dual conceptualization of state-trait anxiety proposed by Spielberger (1966). Multidimensional anxiety theory (Martens, Burton, Vealey, Bump, & Smith, 1990) holds that competitive anxiety, such as state and trait anxiety, can occur at the somatic or cognitive level. Somatic anxiety refers to bodily reactions to over-activation, such as muscular tension, whereas cognitive anxiety refers to thought content, such as worries related to the potential consequences of poor performance. Two questionnaires have been developed based on the above theory. The Competitive State Anxiety Inventory-2 (CSAI-2; Martens et al., 1990) focuses on the situational occurrence of the phenomenon, and the Sport Anxiety Scale-2 (SAS-2; Smith, Smoll, Cumming, & Grossbard, 2006) focuses on sport-specific trait anxiety, originally defined by Martens. While the study of state anxiety provides relevant information about an athlete's assessment of the competition, competitive trait anxiety (also called sport performance anxiety) provides information about an athlete's predisposition to respond to competition with state anxiety, which is a performance-related fear-of-failure construct (Smith, Smoll, & Passer, 2002).

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Corresponding author: Yago Ramis
Dep. Psicologia Bàsica, Evolutiva i de l'Educació. Edifici B
Universitat Autònoma de Barcelona
08193 Barcelona (Spain)
e-mail: yago.ramis@uab.cat

To design individualized interventions for athletes, research in the field of competitive anxiety has focused on identifying differences in anxiety symptoms across groups that differ by gender, age or type of sport. With respect to gender, female athletes typically report higher levels of global competitive trait anxiety (Abrahamsen, Roberts, & Pensgaard, 2008; Martens et al., 1990), factors related to worries (Grossbard, Smith, Smoll, & Cumming, 2009) and precompetitive state anxiety (Thatcher, Thatcher, & Dorling, 2004). Moreover, some researchers suggest that gender serves as a moderator between the antecedents and consequences of anxiety. Specifically, moderating effects have been observed between the motivational climate and anxiety (Grossbard, Cumming, Standage, Smith, & Smoll, 2007) and between anxiety and performance (Woodman & Hardy, 2003). With respect to age, research has focused on the increasing competitive demands associated with age and has observed slightly higher levels of cognitive anxiety in older athletes (Craft, Magyar, Becker, & Feltz, 2003). However, these studies have also found that older athletes exhibit better coping strategies and are more likely than their younger counterparts to perceive this type of anxiety as facilitating their performance (Craft et al., 2003; Cruz, Dias, & Fonseca, 2010). With respect to the effect of the type of sport (i.e., individual versus team sports), studies have primarily focused on state anxiety. In their classic study, Simon and Martens (1979) found that athletes who participate in individual sports such as gymnastics report higher state anxiety levels than do athletes in team sports such as basketball. Consistent with this research, Kirby and Liu's (1999) study of Chinese athletes found that track and field participants report higher somatic anxiety and lower self-confidence than do basketball players. When the type of sport has been examined as a moderator variable, a meta-analysis of the relationship between the CSAI-2 and performance (Craft et al., 2003) has revealed a moderating effect of sport type such that cognitive and somatic anxiety exert a greater influence on performance in individual sports. Therefore, a review of the previous research indicates that most previous studies have focused on the effect of single variables on state anxiety rather than trait anxiety and that few studies have compared the simultaneous effect of multiple variables on competitive trait anxiety.

As noted above, the SAS-2 originated as a competitive trait anxiety measure based on multidimensional anxiety theory that assesses both somatic and cognitive symptoms of sport performance anxiety. The factor structure of the SAS-2 consists of three subscales: (1) a somatic anxiety factor, which evaluates the physiological elements of hyper-activation, such as muscle tension or stomach uneasiness; (2) the cognitive subscales of worry, which assess concerns associated with poor performance; and (3) concentration disruption, which detects difficulties in focusing on relevant aspects of the competitive activity. The item length and content of the SAS-2 have been adapted to be appropriate for children (Smith et al., 2006), and studies have confirmed that it exhibits good psychometric properties for both child and adult samples (Grossbard et al., 2007). As a result, the SAS-2 is viewed as one of the best assessment instruments for child and adolescent athletes (Harris, Blom, & Visek, 2013). In addition, the Spanish version of the questionnaire exhibited good psychometric properties in a study assessing competitive anxiety in Spanish child and adolescent athletes (Ramis, Torregrosa, Viladrich, & Cruz, 2010), and the questionnaire has exhibited good psychometric properties in validation studies of the Flemish- (Jannes, De Pelsemaeker, De Deken, & Van Damme, 2011) and Portuguese-language versions (Sousa, Gomes, Torregrosa, Viladrich, & Cruz, 2011) of the questionnaire.

The above-mentioned studies validating the SAS-2 have included widely accepted procedures, such as translation and back-translation, expert judgment on construct equivalence and psychometric data on internal structure, construct validity and reliability. However, to confirm the equivalence of the different language versions and the comparability of scores across countries, evidence of measurement equivalence based on cross-cultural methods is also required (e.g., Marsh, Nagengast, & Morin, 2013). Due to the multidimensional nature of the SAS-2, measurement invariance based on confirmatory factor analysis (CFA) is the procedure of choice (e.g., Millsap, 2011). In addition, although studies have separately investigated the effects of gender, age and type of sport on competitive anxiety, a more comprehensive understanding is achieved by assessing the relative effect of each factor when all are included in a single analysis using a multiple indicators multiple causes (MIMIC) model (Jöreskog & Goldberger, 1975). In this study, a MIMIC model was used to perform a multiple regression of the three SAS-2 factors on gender, age, language and type of sport to compare group means and determine the relative effects of these variables on the factors of somatic anxiety, worry, and concentration disruption.

To further our knowledge of competitive trait anxiety in youth sports and the psychometric properties of the SAS-2 questionnaire, the current study focused on the following goals: first, to validate the psychometric strengths of the SAS-2 by examining its configural, metric and scalar invariance across gender, age group, type of sport, and three languages; second, to use a MIMIC model to assess differences in competitive trait anxiety among subsamples by comparing the latent mean scores of these groups; and third, to use this MIMIC model to examine the relative contribution of each study variable to self-reported competitive anxiety.

Method

Participants

The participants were 842 athletes (46% female) from Spain, Belgium and Portugal. The athletes ranged in age from 7 to 18 years. As some authors have suggested that cognitive-somatic discrimination might emerge as chronological age increases (see Grossbard et al., 2009), we generated three subsamples of equal size (<11 years; 11-13 years; and >13 years). All participants met the inclusion criteria of regularly practicing and competing in organized sports: 461 in individual sports (e.g., athletics, sailing, judo) and 381 in team sports (e.g., handball, football, water polo). Twenty-three sports were included in the study, and the most represented were basketball (n = 129), gymnastics (n = 113) and swimming (n = 111). Table 1 provides descriptive information for the sample grouped by country.

Instruments

The Sport Anxiety Scale-2 (SAS-2; Smith et al., 2006) is a 15-item questionnaire that assesses the competitive trait anxiety experienced by athletes before or during competition. The scale includes three factors: somatic anxiety, worry and concentration disruption. Participants rate each item related to the statement

"Before or while I compete in sports" (e.g., "my body feels tense"; "I worry that I will not play my best"; "it is hard to focus on what I am supposed to do") on a four-point Likert scale ranging from one (*not at all*) to four (*very much*). The score for each subscale is calculated as the mean of the scores of subscale items and varies from one to four, with a low score indicating a less intense form of that type of competitive anxiety and a high score indicating a high probability of exhibiting that type of anxiety. The items of the original version of the SAS-2 and the Spanish, Flemish and Portuguese versions are presented in Table 2.

Procedure

The current research was developed in accordance with the Ethical Principles of Psychologists and Code of Conduct of the American Psychological Association (APA, 2010) as well as the principles of the ethical boards of all participating universities.

Table 1
Demographic characteristics and internal consistency for the Sport Anxiety Scale-2 (SAS-2) scales for each language version

Country	N	Female%	Individual sport %	M_{age} (SD)	Internal consistency					
					Somatic anxiety		Worry		Conc. disr.	
					α	$\hat{r}$	α	$\hat{r}$	α	$\hat{r}$
Spain	319	34.17	36.05	11.15 (1.66)	.83	.45	.78	.43	.73	.31
Belgium	362	60.22	74.31	12.28 (2.54)	.81	.46	.88	.61	.77	.40
Portugal	161	36.65	47.82	11.61 (2.20)	.79	.43	.76	.40	.81	.46

Note: M_{age} = mean age; SD = standard deviation; Conc. Disr. = concentration disruption; α = Cronbach's alpha coefficient; $\hat{r}$ = inter-item correlation

Table 2
The Sport Anxiety Scale-2 items

Item	English (Smith et al., 2006)	Spanish (Ramis et al., 2010)	Flemish (Jannes et al., 2011)	Portuguese (Sousa et al., 2011)
Somatic anxiety				
2	My body feels tense	Siento que mi cuerpo está tenso	Mijn lichaam is gespannen	Sinto o meu corpo tenso (rijo)
6	I feel tense in my stomach	Siento un nudo en el estómago	Ik voel de spanning in mijn maag	Sinto um nó no estômago
10	My muscles feel shaky	Siento que mis músculos tiemblan	Mijn spieren trillen	Sinto os meus músculos a tremer
12	My stomach feels upset	Tengo el estómago revuelto	Ik heb last van mijn maag	Sinto o meu estômago às voltas
14	My muscle feels tight because I am nervous	Siento mis músculos tensos porque estoy nervioso	Mijn spieren voelen gespannen aan omdat ik nerveus ben	Sinto que os meus músculos estão tensos (rijos) porque estou nervoso
Worry				
3	I worry that I will not play well	Me preocupa no jugar o competir bien	Ik maak me zorgen dat ik niet goed zal spelen	Preocupa-me se não jogar bem
5	I worry that I will let others down	Me preocupa desilusionar a los demás (compañeros, entrenadores, padres…)	Ik ben bezorgd dat ik anderen zal teleurstellen	Preocupa-me desiludir os outros (colegas, treinadores, etc.)
8	I worry that I will not play my best	Me preocupa no jugar o competir todo lo bien que puedo	Ik ben bezorgd dat ik niet op mijn best zal spelen	Preocupo-me se não conseguir dar o meu melhor
9	I worry that I will play badly	Me preocupa competir o jugar mal	Ik ben bang om slecht te spelen	Preocupa-me que vá jogar mal
11	I worry that I will mess up during the game	Me preocupa "cagarla" durante el partido o la competición	Ik ben bezorgd dat ik de wedstrijd zal verknoeien	Preocupa-me fazer asneiras durante o jogo
Concentration disruption				
1	It is hard to concentrate on the game	Me cuesta concentrarme en el partido o la competición	Het is moeilijk om mij te concentreren op de wedstrijd	É difícil concentrar-me nos jogos
4	It is hard to me to focus on what I am supposed to do	Me cuesta centrarme en lo que se supone que tengo que hacer	Ik vind het moeilijk om me te concentreren op wat ik zou moeten doen	É difícil concentrar-me no que tenho de fazer
7	I lose focus on the game	Pierdo la concentración en el partido o la competición	Ik verlies de aandacht op de wedstrijd	Perco a concentração nos jogos
13	I cannot think clearly during the game	No puedo pensar con claridad durante el partido o la competición	Ik kan niet helder denken tijdens de wedstrijd	Não consigo pensar de forma clara durante o jogo
15	I have a hard time focusing on what my coach tells me to do	Me cuesta concentrarme en lo que el entrenador me ha pedido que haga	Ik vind het moeilijk om me te concentreren op hetgeen wat de coach zegt wat ik moet doen	É difícil concentrar-me no que o meu treinador me pede para fazer

Questionnaire administration. After initially contacting club coordinators to request that they participate in our research, we contacted coaches to arrange a date and location to administer the questionnaire. The administration protocol required that two researchers always be present during the procedures to answer participants' questions and ensure that all steps of the protocol were followed. All athletes were informed of the confidentiality of data and voluntarily participated in the investigation. No important incidents occurred during administration of the questionnaire, and athletes were able to continue with their usual practice routines after they finished responding.

Data analysis

In this section, we describe the results of the preliminary analyses with regard to the following: the internal consistency, data normality and CFA of the three SAS-2 factors for each language version; the procedures used to perform the invariance test for language, gender age and type of sport; and the MIMIC procedure used to test the relative contribution of the variables to trait competitive anxiety.

Preliminary analyses. Using SPSS 17.0 (SPSS, 2008), internal consistency was assessed using Cronbach's alpha coefficients and inter-item correlations, and a normality test assessed skewness and kurtosis. Separate CFAs of the SAS-2 were performed for the Spanish (SPA), Flemish (FLE) and Portuguese (POR) subsamples using MPlus 7.0 (Muthén & Muthén, 1998-2012). Based on the original model of Smith et al. (2006), we tested a three-factor CFA model in which all 15 SAS-2 items were employed as indicators of the associated somatic anxiety, worry or concentration-disruption latent factors based on the known pattern of relationships. Following the recommendations of Muthén & Muthén (1998-2012), we treated the SAS-2 items as ordinal variables and employed the weighted least square means and variance adjusted robust estimator (WLSMV). Chi-square, comparative fit index (CFI), Tucker-Lewis index (TLI) and root-mean square standard error of approximation (RMSEA) were used to evaluate the goodness of fit of the proposed models to the data. When testing models with quantitative indicators, CFI / TLI values above .95 and RMSEA values below .06 are considered indicators of excellent fit (Hu & Bentler, 1999), and CFI / TLI values above .90 and RMSEA values below .08 are considered indicators of acceptable fit (Marsh, Hau, & Wen, 2004). Although the behavior of these cutoff values with categorical data remain under discussion (Myers, Chase, Pierce, & Martin, 2011; Yu, 2002), we employed these criteria in this study following previous studies in our field (e.g., Marsh et al., 2013).

Invariance of the three-factor model for the SAS-2. Invariance testing was conducted across groups for three increasingly restrictive models: The multiple-group baseline model, the metric invariance model and the scalar invariance model. The multiple-group baseline model refers to the test of configural invariance across groups of the original model (i.e., the three correlated factors of somatic anxiety, worry and concentration disruption) with all parameters freely estimated. The metric invariance model, which was nested within the multiple-group baseline model, added the restriction of invariant factor loadings across groups. Finally, the scalar invariance model, which was nested within the metric invariance model, added the constraint of equal item thresholds across groups. MPlus performs measurement invariance testing by treating one sample as the reference group in which parameters are freely estimated and fixing the parameters of the other samples to be equal to those of this reference group. In our study, the reference group for language was *Spanish*, the reference group for gender was *boys*, the reference group for age was *<11*, and the reference group for type of sport was *individual sport*.

For the model comparison, both chi-square and CFI indices between nested models were compared. However, because the change in chi-square is sensitive to large sample size, the major indicators for testing model invariance were the changes in CFI, TLI and RMSEA. Following the recommendations of Cheung and Rensvold (2002) and Chen (2007), the more parsimonious model was selected only when the change in CFI and TLI was greater than -0.01 with respect to the more complex model or when the change in RMSEA was lower than 0.01.

MIMIC model for the three factors of the SAS-2. The relative contributions of language, gender, age and type of sport to variations on latent means of somatic anxiety, worry and concentration disruption were determined by performing a MIMIC analysis in which the SAS-2 quantitative latent factors were regressed on language, gender, age and type of sport. The reference groups for the MIMIC model were the same as those above for language, gender and type of sport (SPA, boys and individual sport, respectively), and nonredundant contrasts were set as predictive indicators (i.e., SPA versus FLE, SPA versus POR, boys versus girls and individual versus team sports). However, age was treated as a quantitative predictor for MIMIC modeling because it is a continuous variable.

Results

Preliminary analyses

Internal consistency was assessed for each subscale for every subsample. Cronbach's alpha coefficient ranged from .73 to .89, and inter-item correlations ranged from .31 to .61. These results supported the reliability of each language version of the questionnaire (see Table 1). With respect to distributional assumptions, skewness (range from -0.09 to 1.37) and kurtosis (range from -1.37 to 1.55) significantly departed from values expected under the normality assumption for 10 out of 15 items. Descriptive statistics for all subsamples are presented in Table 3.

A CFA of the correlated somatic anxiety, worry and concentration disruption (see Figure 1) was performed using the WLSMV estimator to address both the ordinality and non-normality of the data. Chi-squares ranging from 133.97 to 209.83 were significant in all samples, but both CFI and TLI were above .95, and the RMSEA indices were .04 for the SPA, .06 for the FLE and .07 for the POR versions of the questionnaire. We concluded that the model fit all the analyzed language-adapted versions. The global CFA results are presented in Figure 1.

Invariance of the SAS-2 Model

As Table 4 indicates, after configural invariance was established across all subsamples (the multiple-group baseline model), parameter invariance was supported at both the metric and scalar levels across all subsamples. The change of less than .01 in the CFI, TLI and RMSEA indices at the metric invariance level indicated that factor loadings were invariant across language, gender, age and type of sport. The negligible changes in these indices with the

Table 3
Means and standard deviations of the three SAS-2 factors across language, gender, age and type of sport

	Language			Gender		Age			Type of sport	
	SPA (n = 319)	**FLE (n = 362)**	**POR (n = 161)**	**Girls (n = 386)**	**Boys (n = 456)**	**<11 (n = 277)**	**11-13 (n = 358)**	**>13 (n = 207)**	**Individual (n = 461)**	**Team (n = 381)**
Somatic anxiety	2.13 (.77)	1.86 (.65)	2.18 (.77)	2.07 (.75)	1.98 (.72)	2.00 (.71)	2.08 (.77)	1.94 (.70)	2.07 (.74)	1.96 (.72)
Worry	3.02 (.74)	2.05 (.78)	3.04 (.75)	2.56 (.92)	2.64 (.88)	2.51 (.94)	2.72 (.88)	2.55 (.86)	2.45 (.92)	2.80 (.84)
Conc. Disr.	1.86 (.57)	1.60 (.52)	1.99 (.65)	1.76 (.60)	1.78 (.57)	1.81 (.53)	1.76 (.59)	1.74 (.64)	1.75 (.60)	1.79 (.58)

Note: SPA = Spanish; FLE = Flemish; POR = Portuguese

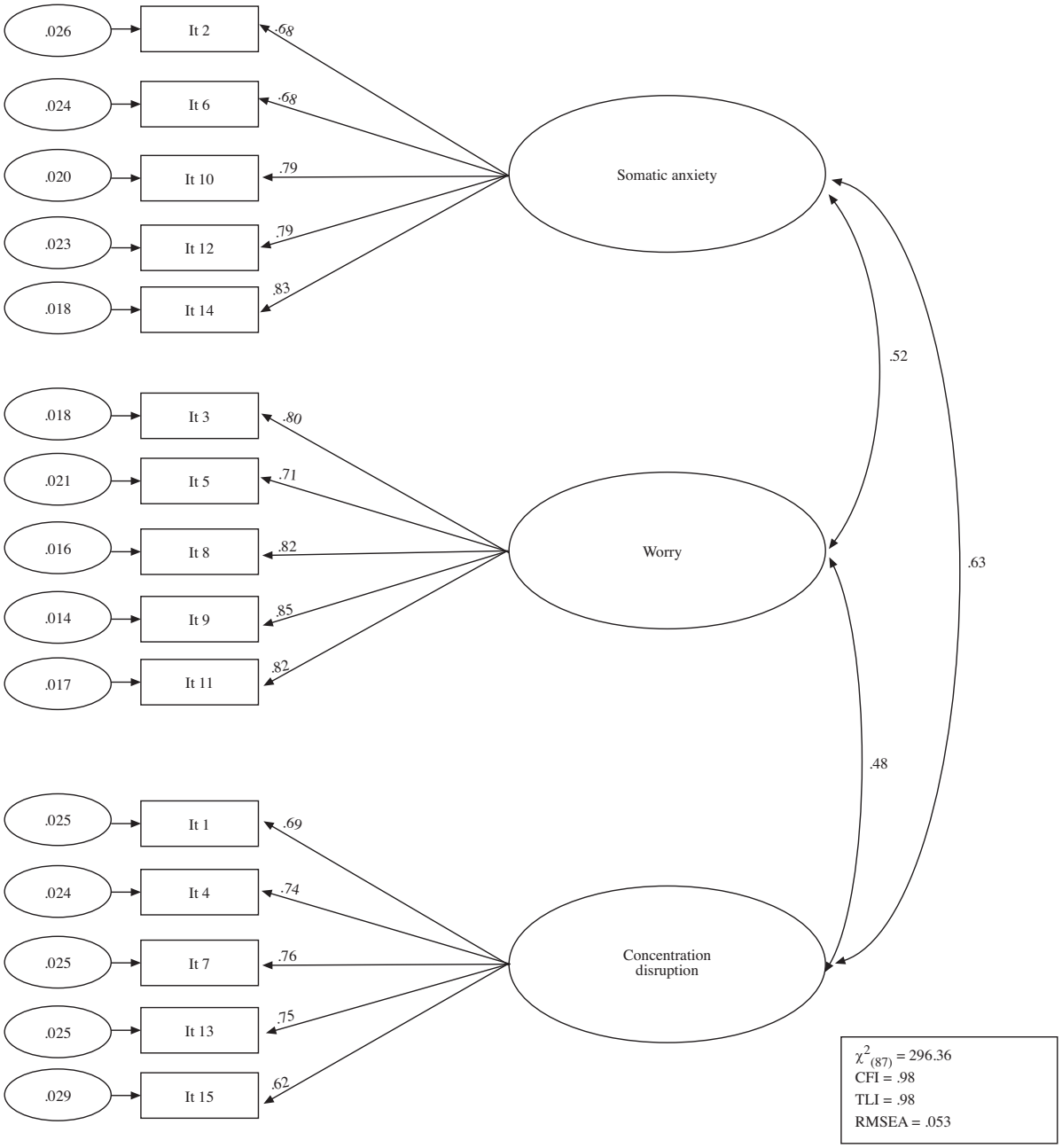

Figure 1. *Standardized factor loadings, correlation coefficients and standard errors of the Confirmatory Factor Analysis for the Sport Anxiety Scale-2. Note: All factor loadings and correlation coefficients were significant at the p<0.05 level*

additional restriction of equal item thresholds supported scalar invariance across all subsamples.

The MIMIC model for the three factors of the SAS-2

Table 5 presents the standardized coefficients obtained for the MIMIC model regression of the three SAS-2 factors on the language, gender and type of sport contrasts as well as on participant age. The fit indices for the MIMIC model were excellent with a significant chi-square of 442.67(147), CFI and TLI of .97 and .96, respectively, and RMSEA under .05. For the language contrasts, although the FLE sample means were below the SPA means for somatic anxiety (β = -.14; p = .002) and concentration disruption (β = -.18; p<.001), the greatest effect was found for worry (β = -.56; p<.001). The POR means were above the SPA means for both somatic anxiety (β = .13; p = .001) and concentration disruption (β = .16; p<.001), but there was no significant effect for worry. With respect to gender, there was only a significant effect for worry, with females exhibiting slightly higher means than males (β = .11; p = .002). Similarly, there was an age effect for the worry subscale, with higher levels of this form of anxiety reported by older athletes (β = .20; p<.001). Finally, there was an effect of the type of sport (i.e., individual versus team sports) for the somatic anxiety subscale, with athletes who participated in individual sports exhibiting higher levels of this type of anxiety (β = -.24; p<.001).

Discussion

The present study is a theoretical and methodological proposal focused on the construct of trait competitive anxiety (Martens et al., 1990; Martens, 1977; Smith et al., 2006). Our results provide evidence of invariance at the configural, metric and scalar levels for three language-adapted versions of the SAS-2. The SAS-2 factorial model also exhibited invariance across gender, age and type of sport.

Table 4
Factorial invariance of the SAS-2 across language, gender, age and type of sport

Model	χ^2	df	$\Delta\chi^2$	Δdf	CFI	TLI	RMSEA	ΔCFI	ΔTLI	ΔRMSEA
Language										
MG baseline model	482.84	261			.976	.971	.055			
Metric invariance	552.56	285	77.97*	24	.971	.968	.058	-.005	-.003	.003
Scalar invariance	667.51	339	144.44*	54	.963	.966	.060	-.008	-.002	.002
Gender										
MG baseline model	373.02	174			.982	.979	.052			
Metric invariance	405.41	186	36.07*	12	.980	.978	.053	-.002	-.001	.001
Scalar invariance	476.90	213	79.22*	27	.976	.977	.054	-.004	-.001	.001
Age										
MG baseline model	502.64	261			.978	.974	.057			
Metric invariance	545.05	285	47.30*	24	.977	.974	.057	-.001	.000	.000
Scalar invariance	572.73	339	50.85	60	.979	.980	.050	.002	.006	-.007
Type of sport										
MG baseline model	402.31	174			.979	.975	.056			
Metric invariance	421.86	186	22.34*	12	.978	.976	.055	-.001	.001	-.001
Scalar invariance	436.50	213	31.61	30	.980	.980	.050	.002	.004	-.005

Note: χ^2 = conventional chi-square fit statistic (under WLSMV estimation); df = degrees of freedom; CFI = comparative fit index; RMSEA = root mean square error of approximation; MG = multiple-group; MG Baseline Model = no invariance; Metric Invariance = invariant factor loadings; Scalar Invariance = invariant factor loadings and invariant item thresholds; Residual Invariance = invariant factor loadings, item thresholds and factor disturbances. * p<0.05

Table 5
Estimates of language, gender, age and type of sport in SAS-2 factors under the MIMIC model

	Somatic anxiety			Worry			Concentration disruption		
	β	p	S.E.	β	p	S.E.	β	p	S.E.
Language									
SPA against FLE	**-.135**	**.002**	**.044**	**-.563**	**<.001**	**.035**	**-.181**	**<.001**	**.045**
SPA against POR	**.132**	**.001**	**.038**	.063	.050	.032	**.160**	**<.001**	**.042**
Gender									
Boys against Girls	.042	.308	.041	**.110**	**.002**	**.035**	.053	.211	.042
Age	.048	.239	.040	**.200**	**<.001**	**.033**	-.018	.662	.041
Type of Sport									
Individual against Team	**-.236**	**<.001**	**.039**	-.051	.153	.036	-.074	.083	.043

Note: SPA = Spanish; FLE = Flemish; POR = Portuguese; standardized regression coefficients; significant coefficients are highlighted in bold

Although there was language invariance with respect to the factor structure, the MIMIC model revealed differences across versions. Spanish athletes reported higher anxiety levels than Flemish athletes, and Portuguese athletes reported higher levels than Spanish athletes on somatic anxiety and concentration disruption, but beta weights were modest in both cases. However, a remarkable effect was found for the FLE/SPA contrast on worry, with Spanish athletes exhibiting higher levels of that form of anxiety. This effect might be due to the different connotation of the term "worry" in Romance languages (i.e., *me preocupa* / *eu me preocupo*) compared to Flemish (i.e., *ik maak me zorgen*). Whereas the Flemish connotation directly implies the uneasiness of anticipating negative consequences, the Romance concept suggests a sense of responsibility regarding the task at hand. This conceptual duality was previously noted by Lane, Sewell, Terry, Bartman and Nesti (1999) when reviewing the original version of the CSAI-2 (Martens et al., 1990), which included the phrase "I am concerned" instead of "I am worried". As these authors suggest, concern might refer to the acknowledgement of the challenge that the competition represents instead of the anxiety that it creates, which would be better expressed by "I am worried". We believe that different nuances are also found in the *zorgen* clause, which appears to be closer to "worry", whereas *preocupación* resembles the concept of "concern".

Measurement invariance was also found with respect to gender, and only a slight significant effect of this variable on the worry factor was revealed by the MIMIC model. These results, obtained by children at an early stage of sport participation, only concur partially with previous studies of higher competitive level samples that suggest gender differences on the three anxiety factors (Abrahamsen et al., 2008; Grossbard et al., 2009). Similarly, a significant age effect on worry revealed higher levels of this cognitive form among older athletes, coinciding with the perspective that higher competitive demands generate higher cognitive symptoms (Craft et al., 2003). Finally, the MIMIC model showed a significant effect of the type of sport on the somatic anxiety factor, with athletes participating in individual sports reporting higher levels of this anxiety form. This outcome is consistent with earlier studies that suggest that when athletes compete as individuals, the pressure to achieve the desired outcome is borne by the individual alone, which intensifies somatic symptoms (Kirby & Liu, 1999; Ramis, Torregrosa, & Cruz, 2013; Simon & Martens, 1979).

This study exhibits certain limitations. The level of competition for study participants was essentially recreational or educational. Further studies should investigate athletes' competitive anxiety in more highly competitive contexts to determine the extent to which reported anxiety levels in general—and gender-based anxiety patterns in particular—vary depending on the competitive level, as the work of Jones et al. (1991) and Thatcher et al. (2004) suggests. Moreover, this study only employed a measure of trait anxiety. To provide a more comprehensive understanding of competitive anxiety, future research should incorporate state anxiety measures, but also individual or environmental variables that might predict anxiety symptoms, such as a coach's interpersonal style and intrinsic and extrinsic motivation.

In conclusion, the present findings demonstrate that the SAS-2 has a good factor structure and good internal consistency and can be used in research independently of participants' language (with respect to Spanish, Flemish and Portuguese), gender, age and type of sport. The SAS-2 appears to be a trustworthy instrument for applied practice and research in the field of sport psychology

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