Sports Humanities

Cross-cultural adaptation of the 3×2 Achievement Goal Questionnaire for Sport in Brazil

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Abstract - Aim: Adapt the 3×2 Achievement Goal Questionnaire for Sport in a Brazilian sporting context and examine its psychometric properties. **Methods:** A total of 211 Brazilian athletes of seven different sports responded to the adapted instrument. **Results:** The confirmatory factor analysis supported the measurement model of the 3×2 Achievement Goal Model with some error correlations and invariance of the measurement model across gender, but not for the type of sport and context of the application. In terms of internal consistency, "task-avoidance" and "self-avoidance" goals did not reach the values of accepted criteria. **Conclusion:** This study supported the use of the 3×2 Achievement Goal Questionnaire for Sport in the Brazilian sport domain and encourages further studies to improve its reliability. Finally, the findings are discussed suggesting cultural differences in the understanding of some items between Brazilian athletes and those from other countries.

Keywords: achievement goals, confirmatory factor analysis, invariance, sport psychology, cross-cultural.

Introduction

The prediction of energization and direction of behaviors in sports situations has been explained by several theoretical models of Psychology[1]. Among these models, the Achievement Goal Theory stands out[2], being, one of the most influential or predominant models in the study of motivation[3,4] mainly in the sports domain, along with the Theory of Self-Determination[5].

The achievement goal allows to understand "the purpose for engaging in competence-relevant behavior"[6]. Competence is the conceptual core of this Achievement Goal Model because it is defined as a condition of skill or effectiveness, representing the state of a person in relation to a task or condition[7,8] and has a rich and profound psychological concept, evident in all individuals, regardless of cultural boundaries[6]. Its status as a psychological construct established the basis for understanding how people interpret, experience, and select their involvement or not in a situation of achievement[6].

Competence-based Achievement Goal Model have had a historical background since the 1980s, with the Dichotomous Achievement Goal Model being the pioneer in achievement goals[9,10]. Elliot et al.[7] proposed the 3×2 Achievement Goal Model in which competence has two dimensions. One of them is its definition (i.e., how it is defined) with three possible references: absolute (task-based), intrapersonal (based on past performance), and normative/interpersonal (based on the performance of others). Another dimension of competence is its valence, which can be constructed in positive or negative terms. Valence evokes behavioral predispositions of approach when positive, or avoidance when negative[8]. Both dimensions - definition and valence - must be considered as necessary components of the 3×2 model of Achievement Goals. The combinations of the dimensions of the 3×2 Achievement Goal Model form six types of achievement goals (Table 1).

The main reason to shift from the 2×2 Achievement Goal Model to the 3×2 Achievement Goal Model is the differentiation of task-based and ego-based definitions of competence, labeled in the same construct: mastery. The findings on mastery-approach or mastery-avoidance vary in terms of whether the athlete's focus is related to the task, the self, or both. Thus, the same label (mastery) would be measuring two different constructs. Thus, a differentiation such as the one proposed in this study comes in handy[8].

The 3×2 Achievement Goal Model has been studied in several contexts, especially educational settings[10].

Table 1 - 3×2 Achievement goals model.

		Definition		
		Absolute (Task)	**Intrapersonal (Self)**	**Interpersonal (Other)**
Valence	Positive	Task-Approach (TAp)	Self-Approach (SAp)	Other-Approach (OAp)
	Negative	Task-Avoidance (TAv)	Self-Avoidance (SAv)	Other-Avoidance (OAv)

Font: Elliot et al. (2011).

Some studies in sporting contexts have used a questionnaire based on the 3×2 Achievement Goal Model. Méndez-Giménez et al.[11] used a developed and validated 3×2 Achievement Goals Questionnaire in the context of school physical education. This questionnaire, which items were based on Elliot et al.[7], proved to be valid and reliable, having 24 items, being four items for each achievement goal (Task-Approach, Task-Avoidance, Self-Approach, Self-Avoidance, Other-Approach, and Other-Avoidance). Garcia-Romero[12] also used the questionnaire to examine the relationship between achievement goals and perceived competence in Spanish high school students in physical education classes. All items were preceded with "In my Physical Activity classes, my goal is…", and he found that participants perceived their own competence as much as they adopted approach goals, regardless of their definition (task, self, or other). Lower and Turner[13] developed and validated a 3×2 Achievement Goals Questionnaire for recreational sports contexts. The questionnaire was also based on the questionnaire developed by Elliot et al.[7] and has 17 items, with the Task-Approach goal loaded with 2 items. In another study, Lower et al.[14] used this same questionnaire to investigate the relationship between achievement goals and perceived benefits of participating in recreational sports with reliable data. Nevertheless, we did not find any version of this questionnaire in Portuguese in the research databases available in Brazil and Portugal, or its validation in the Brazilian, Portuguese, or Lusophone context.

Mascret et al.[8] extended the 3×2 Achievement Goals Model to the competitive sports context, developing and validating the 3×2 Achievement Goal Questionnaire for Sport (3×2 AGQ-S). The authors applied this questionnaire, linking the data obtained with data from other instruments that measure other constructs (implicit theories of motivation, perceived competence, and interest), also testing the factorial structure and psychometric properties of the 3×2 AGQ-S. Compared to other models of achievement goals, the authors conclude that the data fit more closely to the proposed model (3×2 Achievement Goal Model), thus justifying the paradigm shift from the 2×2 Achievement Goals Model to the 3×2 Achievement Goals Model in the sports context. Such data are corroborated by Wang et al.[15] in a study with Asian university athletes from Singapore aiming to examine the psychometric properties of 3×2 AGQ-S. Madigan et al.[16] also found good properties for this instrument in a study with junior athletes from the UK, demonstrating that the 3×2 AGQ-S is a valid and reliable measure. Although these studies corroborate the model, Wang et al.[15] point out that there may be cultural differences between Singaporean and Western athletes in the interpretation of approach and avoidance tendencies of the 3×2 AGQ-S items. A reliable measure of achievement goals could support sport coaches and psychologists to help athletes to pursue the most appropriate goals in their contexts, aligned with the team's and own objectives in sport competitions, given the well-established evidence to explain and predict achievement-relevant outcomes[17].

The present study aims to evaluate the structural validity and the internal reliability of the 3×2 Achievement Goal Questionnaire for Sport adapted to the Brazilian sports context, examining its invariance according to the participants' gender, type of sport, and context of the application. Thus, according to the theoretical model, the hypothesis is that the dimensions assessed by the 3×2 Achievement Goal Questionnaire for Sport will fit better than the several alternative models and will be equivalent (invariant) regardless of the gender of the athletes (male or female), types of sports (individual or collective), and the context of the application (training session or competition).

Method and materials

Participants

A total of 211 Brazilian high-performance athletes (60.7 % male) participated voluntarily in this study with an average age of 25.4 years (SD = 8.72). As a convenience sample, all participants were recruited before the competition, with a personal invitation made by the first author in their training site. The recruitment process took 11 months to be completed and only one judo team, with three male athletes and four female athletes, did not accept to be part of the study. The other teams and athletes invited are part of the sample in this study. The recruitment was made after the authorization of their clubs or federations. All participants were high-performance athletes, with minimal experience in state-level competitions. Table 2 shows the details of the sample in relation to gender and sport practiced.

Table 2 - Participants divided by sex and type of sport.

Type of sport	Sport	Male	Female	Total
Collective	Handball	16	17	33
	Football Association	0	25	25
	Volleyball	13	21	34
	Rugby	36	1	37
	eSports (LOL)	10	0	10
Individual	Chess	1	1	2
	Cycling	10	2	12
	Powerlifting	42	16	58
	Total	128	83	211

Gonzalez[18] presents a Classification System of Sports, developed based on the criteria of cooperation, opposition relation with the adversary, and type of environment where the sport practice takes place. In this way, the modalities may be classified as an individual in which the subject participates alone during the total sportive action (duration of the test, of the game), without the collaborative participation of a colleague; and in collective modalities when they demand, due to their structure and dynamics, the coordination of the actions of two or more people for the development of the sportive performance. In this study, the following sports were studied: rugby, volleyball, soccer, handball, eSports (League of Legends), cycling, chess, and powerlifting.

Regarding the sports experience of the participants, their average involvement with the sport was 7.76 years (*SD* = 5.64) and 46.4% of the sample had already competed nationally or internationally. Finally, 24.6% of the sample completed high school and 23.2% higher education. All participants were informed about the aim of the study and consented to participation by signing the Consent and Informed Term.

Materials

The 3×2 AGQ-S was adapted to the Portuguese language, according to the guidelines for Translating and Adapting Tests of the International Test Commission [ITC][19]. The items of 3×2 AGQ-S were translated by certified translators to the targeted language (Portuguese). With these translated items, the process of version synthesis begins. Synthesizing the versions of an instrument refers to comparing the different translations and assessing their semantic, idiomatic, conceptual, linguistic, and contextual discrepancies, intending to get a single version. After the synthesis of the translated version, a committee of experts in the area of psychological assessment and sports psychology evaluated the diagramation and whether the terms or expressions can be generalized to different contexts and populations (i.e. different regions of Brazil), and whether the expressions are appropriate for athletes. A new step of the process aims to verify that the items, the instructions, and the response scale are understandable to the athletes, if the terms are clear, if they are in accordance with reality, if they are well written, etc. With this version evaluated by athletes, the instrument was back-translated into the original language. This step aims to evaluate to what extent the translated version is reflecting the content of the item, as proposed in the original version. Then, a pilot study was conducted with an application of the instrument to a small sample of nine college athletes that voluntarily accepted to participate in this phase. They assessed the appropriateness of the items concerning their meaning and difficulty of understanding, as well as the instructions for administering the test. Thus, the version produced after these adaptation phases was named *3×2 Achievement Goal Questionnaire for Sport in Brazil* (3×2 AGQ-S/BR) and used to conduct the present study. In addition, clipboards and pens were distributed to the participants to fill in the responses. The 3×2 AGQ-S/BR has 18 items according to the original instrument, with a scale of 1 (strongly disagree) to 5 (strongly agree) aside from them.

Procedure

Athletes responded voluntarily to the 3×2 AGQ-S/BR in the context of their sport (training or competition site) in a place reserved for data collection about 1 hour before the start of the training session or competition. The Research Ethics Committee of the first author's institution approved this study (CAAE nº 57798516.6.0000.5407, approved on August 25th, 2016, Comitê de Ética em Pesquisa da FFCLRP-USP). The questionnaires were printed on A4 sheets and handed to the athletes. Instructions were given for completion, where the athletes should mark on a scale the degree of agreement with the statement expressed in each item of the questionnaire.

Data analysis

Following the analysis process described in Mascret et al.[8], a Confirmatory Factor Analysis (CFA) was conducted with the data obtained comparing the factor structure with that recommended by the 3×2 Achievement Goal Model[7,8]. The data were also compared to alternative models of achievement goals in order to test the fit of the proposed 3×2 model, its validity, and internal consistency, using the same comparison models as the original article of the instrument[8]. The criteria adopted in the present study to define a good model fit were summarized by Schumacker and Lomax[20], which are: χ^2/gl less than 3.0; GFI (*Goodness-of-fit Index*), TLI (*Tucker-Lewis Index*), NFI (*Normed Fit Index*), and CFI (*Comparative Fit Index*) greater than 0.90, and the RMSEA (*Root-Mean-Square Error of Approach*) between 0.01 and 0.08.

Data analysis included testing 11 different models (Table 3): (1) 3×2 Achievement Goal Model with six separated latent variables [Other-Approach (OAp), Other-

Table 3 - Tested models and their respective factors.

Model	Factors
1. 3×2 Achievement Goals	(Oap), (Oav), (Sap), (Sav), (Tap), (TAv)
2. 2×2 Achievement Goals	(Oap), (Oav), (Tap/Sap), (TAv/Sav)
3. Trichotomous	(Oap), (Oav), (Tap/TAv/Sap/Sav)
4. Dichotomous	(Oap/Oav), (Tap/TAv/Sap/Sav)
5. Task-Ap/Task-Av	(Tap/TAv), (Oap), (Oav), (Sap), (Sav)
6. Self-Ap/Self-Av	(Sap/Sav), (Tap), (TAv), (Oap), (Oav)
7. Other-Ap/Other-Av	(Oap/Oav), (Tap), (TAv), (Sap), (Sav)
8. Approach	(Oap/Sap/Tap), (Oav), (Sav), (TAv)
9. Avoidance	(Oav/Sav/TAv), (Oap), (Sap), (Tap)
10. Definition	(Oap/Oav), (Sap/Sav), (Tap/TAv)
11. Valence	(Oap/Sap/Tap), (Oav/Sav/TAv)

Note: Oap = Other-Approach; Oav = Other-Avoidance; Sap = Self-Approach; Sav = Self-Avoidance; Tap = Task-Approach; TAv = Task-Avoidance.

Avoidance (OAv), Task-Approach (TAp), Task-Avoidance (TAv), Ego-Approach (SAp), and Ego-Avoidance (SAv)], which is the intended hypothetical model of this instrument; (2) 2×2 Achievement Goal Model with the Other goal items (OAp and OAv) loaded each one in one single factor, with the TAp and SAp items being joined on one factor and the TAv and SAv items being joined on another factor; (3) Trichotomous model, with the OAp and OAv items loaded on the same factor and the TAp, TAv, SAp, and SAv items united on a single factor; (4) Dichotomous model with the OAp and OAv items united on one factor and the TAp, TAv, SAp, and SAv items united on another factor; (5) TAp/TAv model with five factors, with one factor loaded with the TAp and TAv items and the other items loading their respective hypothetical factors; (6) SAp/SAv model with five factors, with one factor loaded with the items of SAp and SAv and the other items loading their respective hypothetical factors; (7) OAp/OAv model with five factors, with one factor loaded with the items of OAp and OAv and the other items loading their respective hypothetical factors; (8) Approach model, with the items of TAp, SAp and OAp loading one factor and the other items loading their respective hypothetical factors; (9) Avoidance Model with the items of TAv, SAv and OAv carrying one factor and the other items carrying their respective hypothetical factors; (10) Definition Model in which the items sharing the same definition of competence joined on the same factor, being TAp/TAv, SAp/SAv and OAp/OAv and; (11) Valence Model in which the items sharing the same valence joined on the same factor, being TAp/SAp/OAp and TAv/SAv/OAv.

The internal consistency was measured by calculating the composite reliability (CR) for each factor of the tested models, adopting the criteria established by Hair et al.[21] of 0.7 or higher for the composite reliability index, and 0.5 or greater for the Average Variance Extracted (AVE).

Multigroup Factor Analysis assessed the invariance of the 3×2 model in terms of configural invariance and measurement invariance (metric, structural, and residual), considering different groups of participants according to three types of variables: (1) gender (men and women); (2) type of sport (individual and collective) and; (3) context of the application of the instrument (training session and pre-competition). Thus, in the first phase, the configural invariance or plausibility of the free model (not constrained) was tested. For this purpose, the model was adjusted individually for the different groups considered, evaluating the quality of the adjustment. Once the configural invariance was verified, demonstrated by the satisfaction of the adjustment criteria of the free models (e.g. RMSEA and CFI), the second step was to test the invariance of the measurement models in the groups considered. Specifically, for each pair of groups, the invariance of the measurement model was tested by comparing the models with the free parameters (not constrained), respectively with a constrained model, in which they were fixed sequentially for each pair of groups, (1) the factorial loads; (2) the covariance between factors; and, (3) errors. To reject the invariance hypothesis, the criteria proposed by Costa et al.[22] were adopted, namely, a significant difference ($p \geq 0.05$) obtained through the χ^2 test between the free model and the constrained model and/or a decrease in CFI greater than 0.01. All calculations were performed with IBM® SPSS® for Windows™ 25.0 and IBM ® SPSS® Amos software applications.

Results

Confirmatory Factor Analysis (CFA)

The factorial structure of the 18 items was tested as proposed by the 3×2 Achievement Goals Model[7] and also the factorial structure of alternative models tested in the original article of the 3×2 AGQ-S[8], generating the solution from the maximum likelihood. The CFA results for each model are shown in Table 4.

It should be noted that the 3×2 Achievement Goal Model was the one with the best adjustment rates for a good adaptation model when compared to alternative models. It was observed that the RMSEA and CFI indexes of the 3×2 Achievement Goal Model met the criteria adopted in the present study, with the GFI and NFI being below the criterion. It is noteworthy that the value obtained from TLI is very close to the criterion, with 0.001 missing to reach it, which suggests a good fit for the model. None of the other alternative models showed satisfactory adjustment rates. Considering the 3×2 model of achievement goals, Table 5 presents the means, standard deviations, composite reliability, and average variance extracted for each factor of the 3×2 model of achievement goals. It is observed that the responses to the items linked

Table 4 - Comparison of adjustment statistics between the 3×2 Achievement Goal Model and alternative models.

Model	χ^2	df	χ^2/df	RMSEA	RMSEA 90%CI (LO-HI)	GFI	CFI	NFI	TLI
1. 3×2 Achievement Goals	251.499*	120	2.096	0.072	0.060-0.085	0.885	0.921	0.861	0.899
1A. 3×2 Achievement Goals Adjusted	227.641*	118	1.929	0.067	0.053-0.079	0.897	0.934	0.874	0.914
2. 2×2 Achievement Goals	316.668*	129	2.455	0.083	0.072-0.095	0.855	0.887	0.825	0.866
3. Trichotomous	447.073*	132	3.387	0.107	0.96-0.118	0.788	0.810	0.753	0.779
4. Dichotomous	480.618*	134	3.587	0.111	0.100-0.112	0.733	0.791	0.734	0.761
5. Task-Ap/Task-Av	317.049*	125	2.536	0.086	0.074-0.097	0.858	0.884	0.825	0.858
6. Self-Ap/Self-Av	374.528*	125	2.996	0.097	0.086-0.109	0.825	0.849	0.793	0.815
7. Other-Ap/Other-Av	304.229*	125	2.434	0.083	0.071-0.094	0.857	0.892	0.832	0.867
8. Approach	631.194*	129	4.893	0.136	0.126-0.147	0.699	0.697	0.651	0.640
9. Avoidance	386.372*	129	2.995	0.097	0.086-0.109	0.821	0.844	0.786	0.816
10. Definition	443.053*	132	3.356	0.106	0.095-0.117	0.778	0.812	0.755	0.782
11. Valence	727.196*	134	5.427	0.145	0.135-0.156	0.788	0.642	0.598	0.591

Note: *p < 0.001; χ^2 = *chi-square;df = Degree of freedom; RMSEA* = Root-Mean-Square Error of Approach; *GFI* = Goodness-of-fit Index; *TLI* = Tucker-Lewis Index*; NFI* = Normed Fit Index; *CFI* = Comparative Fit Index.

Table 5 - Descriptive statistics. Internal consistency and intercorrelations for the 3×2 Achievement Goal Model adjusted.

Model	Factor	M	SD	CR	AVE	Asymmetry	Kurtosis	1	2	3	4	5
3×2 Achievement Goals Adjusted	1. Task-Approach	4.78	0.45	0.768	0.523	-3.54	17.37	–				
	2. Task-Avoidance	4.27	0.86	0.548	0.295	-1.35	1.66	0.668*	–			
	3. Self-Approach	4.70	0.59	0.746	0.497	-2.81	9.22	0.686*	0.435*	–		
	4. Self-Avoidance	4.27	0.88	0.694	0.438	-1.30	1.63	0.453*	0.892*	0.538*	–	
	5. Other-Approach	3.29	1.32	0.917	0.789	-0.29	-1.09	0.306*	0.398*	0.292*	0.477*	–
	6. Other-Avoidance	3.39	1.16	0.766	0.523	-0.36	-0.76	0.349*	0.577*	0.276*	0.706*	0.852*

Note: *p < 0.001. *M* = Means; *SD* = Standard Deviation; *CR* = Composite Reliability; *AVE* = Average Variance Extracted.

to the Task-Approach and Self-Approach factors obtained the highest values, on average, on the scale.

Regarding reliability, for the 3×2 Achievement Goal Model, we observed that the Task-Avoidance factor presented low CR indices for this model. The Self-Avoidance factor had a CR value very close to that adopted as a criterion (0.04 below the criterion), but it also did not reach it in the AVE. Considering the adjustment indexes of the present study about the 3×2 model of achievement goals, adjustment was attempted by retaining items with a factor load greater than or equal to 0.4 and the correlations of errors suggested by the modification indices of the IBM® SPSS® Amos software application. Thus, item 10 (Task-Avoidance) was maintained from the analysis despite its factorial load being equal to 0.39 and the errors of items 4 (Self-Approach) and 8 (Other-Approach), and items 17 (Self-Avoidance) and 18 (Other-Avoidance) were correlated as suggested. Such corrections resulted in a good adjustment, satisfying all criteria except for the NFI criterion (= 0.886). However, removing 1 item from the scale results in the Task-Avoidance factor having only 2 items, besides not improving its composite reliability (CR = 0.53; AVE = 0.36). Thus, we decided to maintain the factorial structure without adjustments, keeping all items. The model was then tested with the correlations of errors greater than 10.0 suggested by the modification indices of the software application. Items 4 (Self-Approach) and 8 (Other-Approach), and items 17 (Self-Avoidance) and 18 (Other-Avoidance) were correlated as suggested, and the adjustment indexes reached the criterion only for the CFI and TLI (0.934 and 0.914, respectively), improving the GFI and NFI (0.897 and 0.874, respectively), but worsening the RMSEA (= 0.067) when compared to the model without corrections (item 1 in Table 4). The adjusted model is shown in Figure 1.

Multigroup factor analysis

The multigroup analysis of the 3×2 Achievement Goal Model showed invariance when comparing the free model with the fixed-loading model ($\Delta\chi2$ = 18.818; p = 0.093) for the male and female groups, indicating that both men and women respond to items similarly. Comparisons between the configural and metric models showed no invariance, neither for individual or collective sports ($\Delta\chi2$ = 24.591; p = 0.017) nor for the application contexts ($\Delta\chi2$ = 27.888; p = 0.006), pointing out that the athletes of different type of sports do not respond to items similarly and that the context of an application can influence the

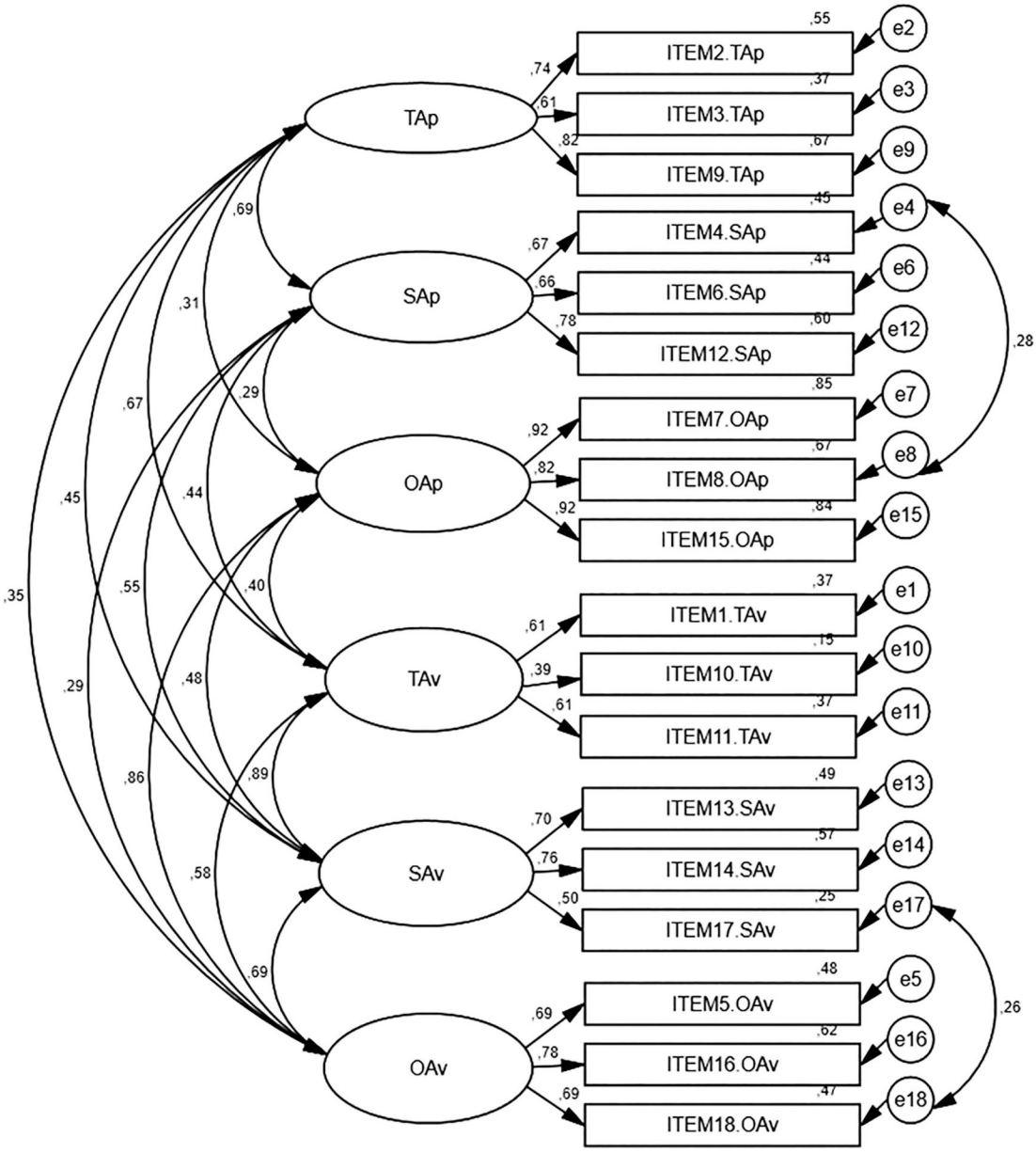

Figure 1 - The adjusted 3×2 Achievement Goal Model after corrections.

way participants to respond to the questionnaire. Table 6 shows the multigroup analysis and the indices compared between them.

Considering that the convergent validity can be observed from the criteria adopted for the Average Variance Extracted (AVE) greater than or equal to 0.5 as a summary indicator of convergence[21], it is noted that the adjusted model does not have convergent validity for the Task-Avoidance and Self-Avoidance factors, but for the other 4 factors (see Table 5). It is noteworthy that the Self-Approach factor presented 0.497 of the extracted average index, being, therefore, considered to satisfy the criterion. The discriminant validity is understood as the degree to which a construct is truly different from the others, being tested by comparing the square root of each factor's AVE and the correlation of all factors.

Therefore, we have $\sqrt{AVE}_{Task\text{-}Approach}$= 0.723; $\sqrt{AVE}_{Task\text{-}Avoidance}$= 0.543; $\sqrt{AVE}_{Self\text{-}Approach}$= 0.704; $\sqrt{AVE}_{Self\text{-}Avoidance}$= 0.661; $\sqrt{AVE}_{Other\text{-}Approach}$= 0.888; $\sqrt{AVE}_{Other\text{-}Avoidance}$= 0.723 higher than nine correlations between factors (see Table 5): Task-Approach and Self-Approach, Task-Approach and Self-Avoidance, Task-Approach and Other-Approach, Task-Approach and Other-Avoidance, Task-Avoidance and Other-Approach, Self-Approach and Self-Avoidance, Self-Approach and Other-Approach, Self-Approach and Other-Avoidance,

Table 6 - Multigroup analysis for the 3×2 Achievement Goal Model adjusted.

Model	Comparison	Invariance	χ^2	df	p<	χ^2	Δ_{df}	p	CFI	Δ_{CFI}	RMSEA
3×2 Achievement Goals adjusted	Gender (Female vs. Male)	Configural	380.350	236	0.001				0.915		0.054
		Factorial loads	399.167	248	0.001	18.818	12	0.093	0.910	-0.005	0.054
		Structural	466.586	269	0.001	86.236	33	0.001	0.883	-0.032	0.059
		Residual	600.930	289	0.001	220.580	53	0.001	0.815	-0.100	0.072
	Sport (Collective vs. Individual)	Configural	394.017	236	0.001				0.910		0.057
		Factorial loads	418.609	248	0.001	24.591	12	0.017	0.903	-0.007	0.057
		Structural	485.473	269	0.001	91.456	33	0.001	0.877	-0.033	0.062
		Residual	703.417	289	0.001	309.400	53	0.001	0.764	-0.146	0.083
	Context (Training vs. Competition)	Configural	373.409	236	0.001				0.921		0.053
		Factorial loads	401.297	248	0.001	27.888	12	0.006	0.912	-0.009	0.054
		Structural	503.313	269	0.001	129.904	33	0.001	0.865	-0.056	0.065
		Residual	661.510	289	0.001	288.101	53	0.001	0.786	-0.135	0.079

Note. Assuming the free model is correct.
Note: χ^2 = *chi-square; df = Degree of freedom; CFI* = Comparative Fit Index; *RMSEA* = Root-Mean-Square Error of Approach.

and Self-Avoidance and Other-Approach; but lower than 5 correlations between factors: Task-Approach and Task-Avoidance, Task-Avoidance and Self-Approach, Task-Avoidance and Self-Avoidance, Task-Avoidance and Other-Avoidance, Self-Avoidance and Other-Avoidance.

Discussion

This study is a pioneer in investigating the 3×2 Achievement Goal Model in a Portuguese-speaking sports context such as Brazil. The factorial structure had to undergo a few adjustments, including keeping an item with a factorial weight lower than 0.4 (item 10). Hair et al.[21] argue that no definition or rule provides general criteria for whether a model is well adjusted or not, but they do provide guidelines for evaluating a good fit taking into account sample size, number of model variables, complexities, and degrees of error. Thus, adopting such guidelines, the final model can be considered a well-adjusted model. It is, therefore, necessary to compare the data obtained in this study with others that used or adapted the 3×2 AGQ-S to their contexts[8,15,16].

The comparison of the chi-square adjustment indices, degrees of freedom, RMSEA, and CFI of the 3×2 Achievement Goal Model tested by Madigan et al.[16], Mascret et al.[8], Wang et al.[15], and the present study indicates a good adjustment of the factorial structures of the 3×2 Achievement Goal Model, as well as in the comparison of such adjustment indexes with alternative models. Observing the data obtained in the present study and comparing it to other studies with the same model, it is verified that the adjusted factorial structure is perfectly acceptable, but its reliability remains to be improved (four out of six factors reached the criterion adopted by the study). The way the items were translated or adapted to the Brazilian sports context may have influenced this result, even with the revision and judgment by former athletes, athletes, coaches, and sport psychologists (as the ITC's guidelines requires to do the adaptation). Brazilian athletes of different sports may have difficulties in responding to items that refer to the avoidance of something. Sentences with double negatives in Brazilian Portuguese may have different functions for those who hear or read them[23]. The same difficulties were perceived by Hangen et al.[17] suggesting that "some respondents may construe a performance-avoidance goal as a complementary component of a performance-approach goal rather than a unique goal in its own right, or they may mentally reconfigure performance-avoidance goal phrasing from a focus on failure ("avoid performing worse") to a focus on success" (pp. 396). A measure based on self-report may suffer a bias caused by the social desirability of those who respond, accepting or rejecting attitudes that could be socially judged[24]. In this line, the contemporary athlete is understood as someone who must seek victory at any cost and not show weakness, after all, he or she is analogous to a hero[25]. Therefore, showing discomfort, anguish, fear, or any other correlated factors that evoke avoidance of a given situation may be socially undesirable in the competition context, even more in individual sports than collective sports[26]. About competition, Elliot[27] says that it can be understood as a "trait, perceived environmental, or structural, is not inherently positive or negative for psychological functioning but can be either positive or negative, depending on the goals that

one pursues out of one's competition-based concerns" (pp. 2). This can explain why the invariance of the model was not achieved on the comparison between the context of application and type of sport.

Effective psychological interventions require precise information about the psychological aspects intervening in the practice of sports, and the mentioned shift to the 3×2 Achievement Goal Model proposes an improved understanding of which achievement goals exert influences on how athletes focus their competence and allow studies to relate this focus with other relevant variables which interferes the sport performance and athletes' well-being. In this sense, an instrument capable to measure these specific focuses in a Brazilian context is relevant for sport scientists and practitioners.

Conclusions

The use of 3×2 AQG-S/BR is suggested as a way to assess the achievement goals of Brazilian athletes. However, it should be noted that the "Task-Avoidance" and "Self-Avoidance" factors do not have adequate reliability and that the factorial structure may vary according to the context of application and type of sports. The variance of the model across the different sports points to the need for studies that consider the specificities of each sport, such as its historical construction, culture, and relations with the environment of dispute and with peers and opponents. Such limitations should stimulate further studies on this questionnaire in order to improve its items, thus improving its reliability and invariance.

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