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Validation of a Tunisian Version of the French Scale State Anxiety in Competition (EEAC): Sport and Exercise Context

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Abstract

This study aims to adapt the CSAI-2 in the French version (EEAC), among 156 Tunisian athlete boys and girls one hour before competition. Therefore, our purpose is to refine the factorial analysis and get a shorter but stronger structure of the EECA version. Our study proposes a new Tunisian version of 13 items with (α = 0.85) instead of the first twenty three French version.

Keywords

CSAI-2, EEAC, Cognitive Anxiety, Somatic Anxiety, Self Confidence, Sport Psychology

1. Introduction

Subject practicing semi professional or professional sport activity or those playing regular competitions are exposed frequently to the competitive stress causing different mood states and shooting behavioral troubles among athletes. Therefore, willing to explore the impact of the competitive stress on the state of humor and because of the lack of adapted scales in Tunisian library, we try to verify a very famous instrument, the French version of CSAI-2 (the EEAC; Cury, F., Sarrazin, P., Pérès, C., and Famose, J.P, 1999) by realizing this study [1], consisting of twenty-three items measuring the following three components: self-confidence, cognitive anxiety, somatic anxiety and evaluating the intensity of cognitive anxiety (characterized by negative expectations and self-doubts) dominated by somatic anxiety symptoms such as increased heart rate and muscle tension while that plus a third component of self-confidence. Anxiety is the most studied variable in psychology including sports psychology.

In fact, Marten's *et al.* (1990) [2] define somatic anxiety as "emotional and physiological components of an-

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xious experience directly from a state of autonomic arousal". Moreover, the cognitive anxiety comes in signs of negative expectations related to performance. Thus, state anxiety is considered as predictors of state cognitive and somatic anxiety (Gould *et al*. 1984; Crocker *et al*., 1988) [3] [4], expectancy of success and achievement of a goal predicted essentially cognitive anxiety (Lane *et al*., 1995) [5]. The age and the expertise are also identified as indicative of state anxiety (Hammermeister and Burton, 1995; Jones and Swain, 1995) [6] [7].

There are an English version CSAI-2R (Cox *et al*., 2003) [8], a Greek version (Tsorbadzoudis *et al*., 2002) [9], a Swedish version (Lunqvist *et al*., 2006) [10] and a French version with 23 items (Scale State Anxiety in Competition; Cury, Sarrazin, Peres, and Famose (1997) [1]. Moreover, the CSAI-2 is subject to a confirmatory factor analysis to develop a Portuguese version. On the other hand, Coelho *et al*. (2007) [11] have set themselves the goal of measuring the factor structure of CSAI-2. They are administered to two subgroups of footballers; the first consists of 266 players at the regional level. The results of the confirmatory analysis reveal a better two-factor version of 18 items adapted to the Brazilian footballing population ($p < 0.057$). The authors of this study confirm that their version is better compared to the version of Cox *et al*. (2003) [8] and three factors and 17 items. Terry *et al*. (2008) [12] have conducted research to reassess the psychometric properties of the CSAI-2R release to 17 items proposed by Cox *et al*. (2003) [8]. Repeated measures data collected from 92 tennis players performed at five pre-competitive are the subject of a principal factor analysis (promax rotation). The results confirm the three-factor model measures.

2. Method

The purpose of this study is an adaptation of a French version of the rating scale of competitive anxiety (EECA).

2.1. Participants

To achieve this, we selected 156 athletes from practicing all the various types of sports; team and individual all young athletes' schoolchildren. (Age: 18.66 ± 2.87 years) and licensed in their specialty (see **Table 1**).

Table 1. Descriptive statistics.

	Male	Female	Total
Sample size	109	47	156
Age	18.59 (2.26)	18.81 (3.90)	18.66 (2.87)
Level of instruction	12.53 (2.72)	12.98 (3.65)	12.76 (2.80)

Table 1 shows a normal distribution of the sample composed by 156 athletes all semi professional, 109 males and 47 females. Analyses revealed a normal distribution and no significant difference $p > 0.20$.

Figure 1 shows clearly a normal distribution of the level of instruction indicating a homogeneity perceived in the red gauss curve.

Figure 2 shows also a regular normal distribution of the nominal variable age and non significant difference between males and females of the sample.

2.2. Procedures

The linguistic validation method of the instrument includes the steps proposed by Vallerand (1989). The first concerns the development of a preliminary version which consists of a type evaluation committee, and an assessment of the clarity of items pretest on the target population. The second step involves assessing the accuracy and validity of the instrument consists of factor analysis known as "exploratory" and a search for internal consistency. We translated the scale into Arabic, simple-translation and reverse (forward/backward translation) then applied concurrent assessments and analyzed the content and reliability and construct validity by investigating the factor structure to assess, in the end, consistency internally.

2.3. Data Collection

To attend the meaning of interaction between the different variables and the significance of the eventual rela-

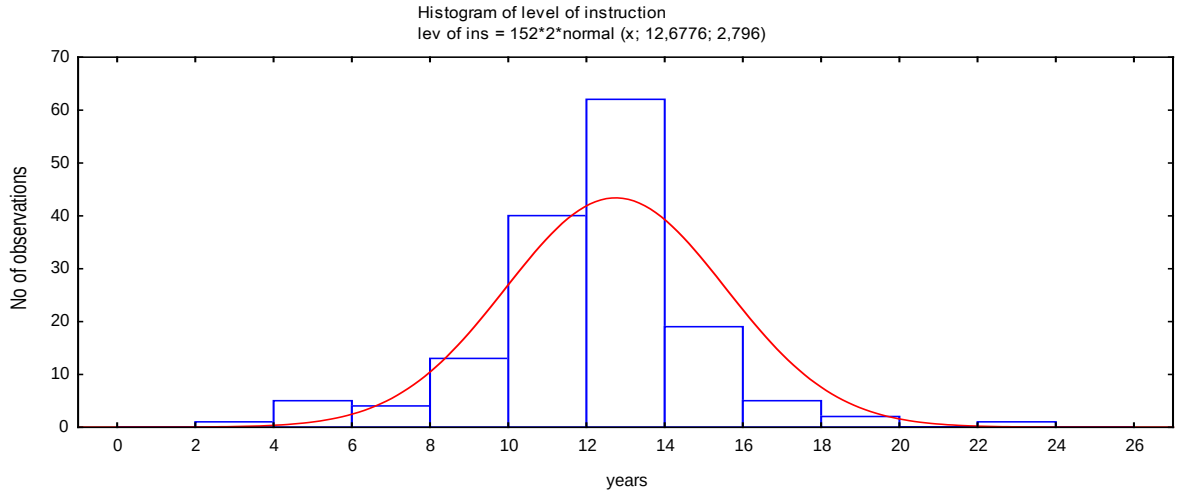

Figure 1. Distribution by level of instruction.

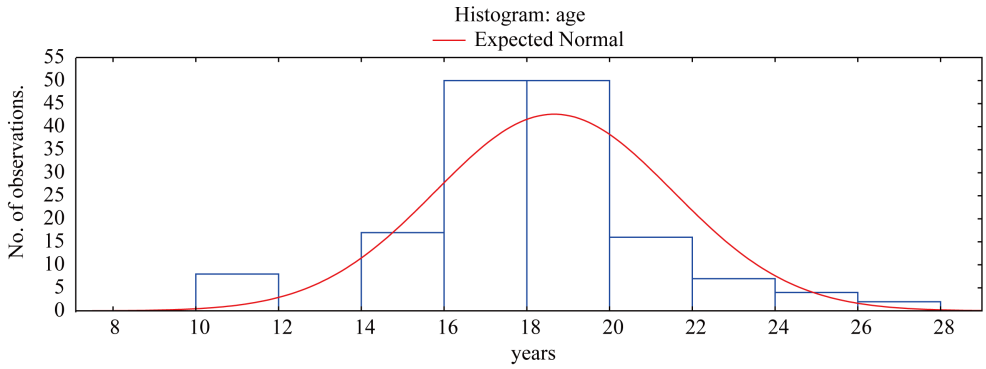

Figure 2. Distribution by age.

tions we used the statistica 8 [13] program applying the basic statistics, the parametric and non parametric methods using tables and adequate figures to achieve the ultimate analysis of the collected data.

3. Results

The exploratory analysis aims to formulate a first version of the instrument from the responses of a sample of athletes. Only items whose loadings are above (0.45) and only factors with Eigen values greater than 1 were retained.

3.1. Main Analysis

Factor structures features are represented and then subjected to analysis of internal consistency by calculating Cronbach's alpha coefficient for judging the homogeneity of the subscales comprising the two questionnaires. The index ranges from 0 to 1. Consistency is considered acceptable when the alpha is between 0.60 and 0.90.

Table 2 shows a normal distribution of the results obtained among our sample and no significant difference was revealed. In the first dimension of cognitive anxiety males n = 109 obtain a mean of 17.19 with standard deviation 3.67 however females n = 47 got a mean of 16.38 and standard deviation 6.07. Total mean in this dimension is 16.95 and standard deviation 4.40. On the other hand males obtain in the second dimension measuring the somatic anxiety a mean of 22.93 and standard deviation 2.64. Females have a mean of 19.80 with standard deviation of 5.09 and total score in this dimension was 21.88 with standard deviation 5.09. In the last dimension self confidence, results are as follows: males obtain a mean of 16.45 and standard deviation 4.45. Females got a mean of 15.33 and standard deviation 6.96. Finally, total mean for males is 56.27 with standard

Table 2. Descriptive statistics per dimension.

	Male n = 109	Female n = 47	Total N = 156
Cognitive Anxiety	17.19 (3.67)	16.38 (6.07)	16.95 (4.40)
Somatic Anxiety	22.62 (3.96)	19.80 (7.13)	21.88 ((5.09)
Self confidence	16.45 (4.45)	15.33 (6.96)	16.16 (5.20)
Total	56.27 (9.44)	51.52 (18.21)	55.02 (6.50)

Table 3. Factorial respective dimensions of the Tunisian version.

Factor	1	2	3	4	5	6
DIMENSION						
COGNITIVEANXIETY						
3				0.65		
6	0.64					
9	0.68					
12	0.77					
15	0.72					
18	0.70					
20	0.80					
SOMATIC ANXIETY						
1						
4					0.78	
7					0.49	
10				0.72	0.46	
13			−0.75			
16				0.66		
22				0.55		
SELF CONFIDENCE						
2						
5		−0.75	−0.55			
8		−0.70				
11						
14		0.70				
17						
19						.60
21			−0.60			
23						

Table 4. Hierarchial multiple regression analysis predicting mood and self confidence interactions.

Predictor	R	R^2 Change	B	SE B	β
Gender	0258	0.029*			
Cognitive Anxiety			0.012	0.017	0.125
Somatic Anxiety			0.025	0.011	−0.291*
Self Confidence			−0.004*	0.013	0.056

Note N = 156, *p < 0.05, R = simple regression, R^2 = adjusted regression, SE B = Standard Estimation of B.

Table 5. Confirmatory analysis of Tunisian version of EEAC.

N	Mean	SD	α Crombach	α Standerdized	Other quest
156	57.17	5.99	0.44	0.40	0.05

N = sample size, *SD = standard deviation*.

Table 6. Comparison between the French and the Tunisian versions of CSAI-2.

	French Version of Csai-2	Tunisian Version of Csai-2
Cognitive Anxiety	3-6-9-12-5-18-20	6-9-12-15-18-20
Somatic Anxiety	1-4-7-10-13 inversed-16-22	1-4-7-10-16-22
Self-Esteem	2-5-8-11-14-17-19-21-23	2-5-8-11-14-19+13

deviation 9.44. Females obtain a mean 51.52 and standard deviation of 18.21. However total score is 55.02 with a standard deviation 6.50.

3.2. Factorial Analysis

Factorial analysis performed on data collected after the award with 156 athlete boys and girls practitioners of different sports: Team, individual and combat (contact), in pre-competitive situation is thirty minutes to an hour before the competition has led us to identify six factors (**Table 3**). As to the different dimensions the results showed that: 1) Dimension of Cognitive Anxiety as measured by test ($F = 0.11$; $p < 0.05$). 2) The dimension of somatic anxiety ($F = 0.10$; $p < 0.10$). 3) And the third dimension Self-confidence ($F = 0.09$; $p < 0.20$). Thus we can present the factors of Tunisian version with respective items as follows: Following distribution of items per factor, we find that the three dimensions that measure the CSAI-2 have emerged in the Tunisian version of a separate and very clear. The only remark is the fact that you can delete items 21 and 23. The item 21: I am confident because I see myself succeed. The item 23: I am sure not yield to pressure. These two items not mentioned in any of the six factors identified.

Table 3 shows a big similarity in factor distribution between the French CSAI-2 version twenty three item scale and the Tunisian version of the same scale. Analysis of Inter-items correlations were subjected to principal components factor analysis, followed by Varimax orthogonal rotation procedure for isolating items saturating the best studied factors reveals a coefficient Crombach ($\alpha = 0.44$). A second analysis was performed on selected items. In order to provide the best possible compromise between the extent of the scale and its internal consistency, we note that 13 items ($\alpha = 0.84$) to three factors instead of seven factors for the version with 23 items could fit better.

Moreover, regression summary, as shows (**Table 4**) for dependant variable gender shows; $R = 0.258$ and $R^2 = 0.066$, an adjusted $R^2 = 0.029$, $F(3.76) = 1.80$, $p < 0.05$. Standard deviation of estimate = 0.4361.

So, for simple regression analysis of the first dimension, cognitive anxiety examination of the coefficients indicate ($B = 0.012$, $SE = 0.017$, $\beta = 0.125$, $p = 0.66$).

Concerning the somatic anxiety, simple regression analysis examination of the coefficients indicate ($B = -0.025$, $SE = 0.011$, $\beta = -0.291$, $p = 0.034$).

In the last dimension self confidence ($B = -0.004$, $SE = 0.013$, $\beta = 0.056$, $p = -0.05$).

The objective of our study is to develop a Tunisian version of the factorial validity of the (23 items) French version of CSAI-2. The purpose is to be as objective as possible assessing emotional and mood competitive dimensions trying the best to determine their Tunisian cultural specificities. Results are as following, look **Table 5**).

Table 6 shows clearly the consistency and the robustness of both of the French and Tunisian version of the structure and the reliability of CSAI-2 despite the cultural differences proving the uniformity of human being and the biological determinations such as the emotions and especially anxiety and self confidence.

4. Discussion

Lane [5] by managing the scale an hour before the competition has come from the fact that for the two subgroups, measures of the robustness index benchmarking are as follows: group A = 0.82, Group B = 0.84 and simultaneously measuring the comparative index 0.83 suggesting that the model assumed a low index showing the factor structure proposed by Martens [2] is low. The results these authors have managed can lead to the conclusion that the low level of cognitive anxiety is related to the translation of items in the world precisely the "concerned" instead of "anxious". Lane *et al.* (1999) [5] emphasize the fact that the item "in English" concerned being affected by an impending performance does not necessarily mean that the athlete has dark thoughts and negative but recognizes that the athlete recognizes the importance and difficulty of the challenge and tries to mobil-

ize his or her resources to cope. Thus, Lane [5] questions the use of the CSAI-2 as a valid measure of anxiety-state competitive. By applying structures suggested by previous study, with two samples, 287 students in physical education and sports, and 323 individual sport athletes. Results indicate according to certain authors [2]-[5] of work poor posture of the model. Other structures have been suggested by various other authors who are analyzed showing levels of acceptable values of good index and some others are not adequate. The authors propose a new model, scale-free awakening, showing an adequate fit calibration sample and its capacity has been validated by the second sample. The authors reveal a double negative correlation scales (negativity and self-confidence).

The study confirms the psychometric properties of the CSAI-2R [8] which he considers satisfactory squaring results of Lane *et al*. (1999) [5] who considers those of the original version (CSAI-2) [2] as defective and to which our results are not in line. Terry *et al*. [13] invite to use version CSAI-2R [8] instead the 27 items (CSAI-2) [2]. We can criticize the English version [2] while supporting the French version of the EEAC [1], even if results don't agree with the findings of Lane [5] concerning the factorial or structural robustness of the CSAI-2. We confirm the three factorial construct of the French version (23 items) [1]. However, our findings agree the fact that the confusion can be caused by the translation of the item "concerned" which should be "anxious" and not "interested".

In conclusion, it is an opportunity for future scientific studies to light on this aspect improving the conditions of such assessments in very special competitive circumstances, characterized by the rapid changes.

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