Preliminary validation of a brazilian version of the sport motivation scale[*]

Validación preliminar de una versión brasilera de la escala de motivación para el deporte

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Abstract

The Sport Motivation Scale was firstly developed in French and later translated into English and validated by Pelletier et al. (1995). It is based on the principles of self-determination theory. The present study translated the English version into Portuguese to access and validate it with Brazilian athletes using a sample of 419 athletes (127 women and 292 men) from ten sports. The Brazilian version of the scale showed satisfactory levels of internal consistency and temporal stability over a four-week period. The results of a confirmatory factor analysis partially supported the seven-factor structure. Finally, gender differences were found in all subscales. Taken together, these findings support the use of the Brazilian version of the scale for the assessment of motivation in sport.
Key words authors
SMS, Portuguese, Athletes.
Key words plus
Psychological Research, Psychological Tests, Sport, Motivation, Self Discipline.

Resumen

La Escala de Motivación Deportiva fue desarrollada en francés, traducida al inglés, y validada por Pelletier et al. (1995). Está basada en los principios de la Teoría de la autodeterminación. El presente estudio tradujo la versión en inglés al portugués para validarla con brasileños, utilizando una muestra de 419 deportistas (127 mujeres y 292 hombres) pertenecientes a diez modalidades. La versión brasileña demostró niveles satisfactorios de consistencia interna y estabilidad temporal, durante cuatro semanas. Los resultados del análisis factorial confirmatorio soportaron parcialmente la estructura de siete factores. Diferencias por sexo fueron encontradas en todas las subescalas. Los resultados confirman la posibilidad de utilización de la versión brasileña para evaluar la motivación en el deporte.
Palabras clave autores
SMS, Portugués, deportistas.
Palabras clave descriptores
Investigación psicológica, test psicológico, deporte, motivación.

Introduction

Motivation is an essential factor in many life events, since it is the main reason that makes someone to do their tasks. In sports, it is not different, being motivation an extremely important in the development of training and competition process (Bara & Miranda, 1998; Cox, 1994; Martín-Albo, Núñez & Navarro, 2003; Miranda & Bara, 2002; Weinberg & Gould, 1995). Following these thought, sports psychology researchers from different parts of the world have shown that this is one of the most studied topics worldwide.

To understand, categorize and drive motivation is essential toward the understanding of the athlete action in sport. In this way, Sage (1977) defines motivation as the direction and intensity of an specific effort. Therefore, motivation gains a individual character in which each individual acts following his goals, being influenced by personal (intrinsic) and environmental (extrinsic) factors (Cox, 1994; Cratty, 1984; Martens, 1997; Weinberg & Gould, 1995).

One of the theories that explain these intrinsic-extrinsic concepts of motivation is the Self-Determination theory (SDT). This theory is directly related to the individual self-improvement in all training process and is directly associated with motivation aspects. To be better comprehended, motivation was categorized in intrinsic, extrinsic and amotivation (Deci & Ryan, 1985, 1999; Ryan & Deci, 2000).

The intrinsic motivation is understood as the self-determination and competence, when the individual has the task as the goal by himself, searching for personal satisfaction (Deci & Ryan, 1985). It has been considered a global construct from which three types may be distinguished: (a) to know implies the satisfaction in learning new things, (b) to accomplish refers to the desire to reach new goals established, and (c) to experience stimulation refers to the desire to participate in activities to have fun and to experience new sensations (Vallerand et al., 1992; Vallerand & Ratelle, 2002).

In the other way, the extrinsic motivation is related to the necessity of receiving rewards in order to be engaged in the activities, being not focused in the task itself. The SDT considers four types of extrinsic motivation ordered from the lowest to the highest amount of self-determination: (a) External regulation refers to tasks are done aiming rewards and avoiding punishment, (b) Introjected regulation implies that the individual internalize the reasons for his action, implying some pressure to do something, (c) Identified regulation refers to the aim of having the effort recognized by others, and (d) Integrated regulation that occurs when an individual do a self-examination, bringing new regulation (Deci & Ryan, 1985, 1991; Ryan & Deci, 2000).

The third dimension proposed by the SDT is amotivation. That means the lack of intrinsic and extrinsic motivation and it is not observed any confidence with behaviors. The individual feels incompetence and loss of situation control (Deci & Ryan, 1985, 1991; Vallerand & Ratelle, 2002).

The different motivational dimensions can be ordered along a self-determination continuum from intrinsic motivation, the most self-determinated motivational type, followed by Integrated regulation, Identified regulation, Introjected regulation, External regulation, and Amotivation, which involves the least amount of self-determination (Deci & Ryan, 1985, 1991; Ryan & Deci, 2000).

With the aim of assessing the different types of motivation, Brière, Vallerand, Blais and Pelletier (1995) developed in French the Échelle de Motivation dans les Sports being composed by 28 items structured in seven subscales of four items each, which evaluated the three forms of intrinsic motivation, three types of extrinsic motivation (External regulation, Introjected regulation, and Identified regulation) and Amotivation. Later, this scale was translated into English by Pelletier et al. (1995) entitled the Sport Motivation Scale (SMS). Both studies found similar and satisfactory values in internal consistency with alphas ranging from 0.71 to 0.92 and 0.63 to 0.80, respectively, and moderate levels of temporal stability from 0.54 to 0.82 and 0.58 to 0.84, respectively.

Aiming to analyse the SMS Greek version, Doganis (2000) had a sample of 134 atlhete, finding a moderate to good internal consistency in the scales (Crombach Alpha ranging from 0.64 to 0.78). More recently, Núñez, Martín-Albo, Navarro, and González (2006) also found similar results in their validation to Spanish. With a sample 275 athletes, they found a Cronbach alpha ranging from 0.70 to 0.80 and a test-retest correlation ranging from 0.68 to 0.74. Also found that men score higher than women in all scales. Others studies also found adequate psychometric properties in the SMS (Li & Harmer, 1996; Martens & Webber, 2002).

It is observed a lack of adequate questionnaires translated and validated to Portuguese to useful with Brazilian athletes. In this sense, the SMS has been an adequate instrument to evaluate motivation in the sports settings in different languages, however it has not been validated in Brazilian athletes. So the purpose of the present study was to translate the SMS into Portuguese through adequate transcultural procedures, to examine the factor structure, to assess the construct validity, to assess the reliability through internal consistency and the temporal stability of the scale, and to examine the effect of gender on the seven subscales.

Method

Translation of the SMS to Portuguese

The SMS scale translation into Portuguese was done using transcultural translation procedures already used in previous studies (Núñez et al., 2006; Vallerand, Blais, Brière & Pelletier, 1989). Firtly, the scale was translated from English to Portuguese according to the *parallel back-translation* procedure, done by bilingual individual (Brislin, 1986), in which the scale is translated from its original language into the language that will be used in the future studies. Secondly, this translation is done the original language again by another bilingual individual without knowing the scale. To ensure the correct translation and to avoid possible mistakes, these sequence mentioned is repeated again,

in order to have four bilingual individual involved in *parallel back-translation* procedure to obtain the SMS Brazilian pilot versions. In the next step, the scales were evaluated by a committee composed by the ones involve in the translation process and four experts in sports psychology to make final adjustments of the scale and instructions. Therefore, 28 items that represents the reasons why athletes take part in sports compose the SMS Brazilian being named Escala de Motivação Esportiva (EME). These reasons were rated in a 7-point Likert scale ranging from (1) does not correspond at all until (7) correspond exactly.

Participants

A total of 419 Brazilian athletes (292 men and 127 women) from ten sports (volleyball, basketball, handball, modern pentathlon, football, futsal, swimming, cycling, taekwondo, judo) composed the sample. The mean age of the participants was 24.19 years (SD = 5.53). To assess the temporal stability, a new sample composed of 60 athletes (32 men and 28 women) with a mean age of 20.40 years (SD = 3.59) was tested to answer the scale twice over a four week period.

Instrumentation

To evaluate the sport motivation, the SMS Brazilian version was used. The scale comprised 28 items structured in seven subscales: Amotivation, External regulation, Introjected regulation, Identified regulation, intrinsic motivation to know, intrinsic motivation to accomplish, and intrinsic motivation to experience stimulation. Each item answered the following question: "Why do you practice your sports?" (eg. "For the pleasure I feel in living exciting experience") and were rated on a 7-point Likert-type scale from (1) *does not correspond at all* to (7) *correspond exactly,* with the mid point (4) *correspond moderately*. Other information such as gender, age, type of sports, training years were assessed by a general questionnaire.

Procedures

First of all, the research project was approved by the Universidade Federal de Juiz de Fora ethic committee. After that, team head coaches and clubs were contact to access athletes that gave formal voluntary consent agreement to the study. Two researches administered the SMS to the athletes asking them to answer the question honestly without time limit. Each researcher was present during SMS application to ensure necessary help to verify each procedure.

Results

Descriptive analysis

The asymmetry and kurtosis indices if all SMS 28 items are close to zero and below two, recommended by Bollen and Long (1994), what indicated the similarity with the normal curve. These results allow the use of factorial techniques of maximum likelihood in the factorial analysis done.

Confirmatory factor analysis

It was done the confirmatory factorial analysis (CFA) with AMOS 6.0 statistics program. Through this analysis it can be observed in which magnitude the seven factor theoretical construct proposed by Brière et al. (1995) is adjusted to the present data. This analysis was done using the estimation of maximum likelihood and the covariance matrix as input for the data analysis.

The fit index CFI and IFI were used to evaluate and adjust this model, ranging between 0 and 1, considering values above 0.90 as minimally acceptable (Shumacker & Lomax, 1996). The SRMR which values 0.06 or less indicate a good adjustment and the RMSEA, which values of 0.05 or less indicates that the model based on the sample data represents a "close population fit", whereas a value less than 0.08 indicates a "reasonable fit" (Jöreskog & Sörbom, 1993).

Firstly, the seven factor confirmatory analysis was done. The results showed a significant chi-

square ($\chi^2 = 1036.68$, $df = 329$, $p < 0.01$) being IFI = 0.86, CFI = 0.85, RMSEA = 0.07, and SRMR = 0.07). In the same way as the previous SMS versions (original-French, English and Spanish) which used interactions among the standards errors to adjust the model, it was added to the model eight standard errors interactions obtained through index modification, doing another analysis in which the results depicted a better model adjustment. IFI = 0.90, CFI = 0.90, RMSEA = 0.06 y un SRMR = 0.06, ($\chi^2 = 810.09$, $df = 321$, $p < 0.01$). The factorials indexes found in each factors were statistically significant ($p < 0.01$) with standard values over 0.50.

Correlations among subscales

The correlations among the SMS subescales should depicts the presence of the self-determination continuum (Deci & Ryan, 1985) from Amotivation to intrinsic motivation, presenting positive correlations among the intrinsic motivation subscales, and negative correlations to opposite subscales. To prove the existence of specific association based in the self-determination theory, it was analyzed the correlation among the seven subscales using the Pearson index correlation.

Table 1 shows that correlations among the three intrinsic motivation types are strong and positive, ranging between 0.64 y 0.72 ($p < 0.01$). Moreover, is can be observed that correlations among adjacent subscales in the same self-determination are positives (e.g. between External regulation and Introjected regulation, $r = 0.52$, $p < 0.01$). On the other hand, subscales at opposite endings of the continuum (e.g. Amotivation and intrinsic motivation to Experience stimulation, $r = -0.10$) are lower or negatives.

Reliability

The internal consistency of the SMS seven subscales was assessed using the Cronbach alpha coefficient. The obtained values are showed in the in the diagonal in Table 1 and ranged from 0.70 (Amotivation) to 0.81 (intrinsic motivation to know).

TABLE 1
Pearson correlations (above diagonal) and consistency values: Cronbach Alpha (on diagonal)

Subscale	1	2	3	4	5	6	7
Amotivation	(0.70)	0.27**	0.16**	0.14**	-0.08	0.01	-0.10
External regulation		(0.74)	0.52**	0.54**	0.38**	0.42**	0.37**
Introjected regulation			(0.75)	0.57**	0.37**	0.45**	0.46**
Identified regulation				(0.78)	0.48**	0.54**	0.54**
IM-to know					(0.81)	0.72**	0.64**
IM-to accomplish						(0.80)	0.67**
IM-stimulation							(0.77)

$^{*}p < 0.05$. $^{**}p < 0.01$, 95% CI.

Source: Own Work.

The temporal stability of the SMS was assessed using a sample composed of 60 athletes who answered the questionnaire twice over a one-month period. As can be seen in Table 2, the results from the internal consistency for the pretest and the posttest ranged from 0.55 to 0.85 at the pretest, and from 0.68 to 0.82 at the posttest. Furthermore, the test-retest correlations ranged from 0.57 to 0.82.

Gender differences

Gender differences by subscale means were assessed by using a test for independent samples with a Levene's test for equality of variances ($p < 0.01$). The findings showed that male athletes scored higher than females in all subscales (Table 3).

TABLE 2
Internal Consistency Values (Cronbach Alpha) and Test-Retest Correlations of the SMS Subscales

	Alpha pretest	Alpha posttest	Test-retest correlations
Amotivation	0.60	0.84	0.70
External regulation	0.67	0.73	0.71
Introjected regulation	0.55	0.71	0.57
Identified regulation	0.83	0.82	0.70
IM-to know	0.68	0.68	0.70
IM-to accomplish	0.85	0.82	0.82
IM-stimulation	0.80	0.75	0.70

Note. N = 60.

Source: Own Work.

Table 3
Means and Standard Deviations of the SMS Subscales for Women and Men

Subscales	Women		Men	
	M	SD	M	SD
Amotivation*	1.92	1.40	2.22	1.35
External regulation*	2.95	1.27	3.94	1.49
Introjected regulation*	4.10	1.41	5.05	1.45
Identified regulation*	4.54	1.45	5.19	1.33
IM-to know*	5.06	1.41	5.43	1.32
IM-to accomplish*	5.14	1.41	5.49	1.27
IM-stimulation*	5.65	1.16	5.94	1.01

Note. * $p < 0.05$ with the 95 percent confidence intervals.

Source: Own Work.

Discussion

The main purpose of the present study was to translate and to validate the Sport Motivation Scale (SMS) into Portuguese. The results indicated that the SMS Brazilian version showed adequate levels of reliability and validity. With respect to the reliability of the scale, the results showed acceptable levels of internal consistency for all subscales with similar values to those found in the original study (Brière et al., 1995), in the English (Pelletier et al., 1995), the Greek (Doganis, 2000) and the Spanish versions (Núñez et al., 2006). However, the Brazilian version showed some peculiarities since the lowest alpha value was Amotivation, differently from the Identified Regulation in the three studies mentioned before. Moreover, the values of the test-retest correlation indicated a temporal stability for all subscales very similar to the previous versions.

Regarding the validity of the scale, results from the confirmatory factor analysis partially supported the seven factor structure of the Brazilian version of the scale. The fit indices obtained are similar with those obtained with the Canadian (Brière et al., 1995; Pelletier et al., 1995), Greek (Doganis, 2000) and Spanish (Núñez et al., 2006) samples, which suggests that the seven factor correlated structure constitutes an oblique model.

Regarding the correlations among SMS subscales, the Brazilian version depicted similar results compared to others studies (Núñez et al., 2006; Pelletier et al., 1995). The results showed that the subscales theoretically closer to each other on the self-determination concept having higher correlations than those theoretically distant (Deci & Ryan, 1985) supporting the existence of a simplex pattern.

Finally, gender differences showed male athletes had higher scores than female athletes on all subscales. These results presented some differences once compared with others researchs (Brière et al., 1995; Núñez et al., 2006; Pelletier et al., 1995). In the Spanish version, significant differences were found only in two subscales (amotivation and external regulation) however men scores were higher in all subscales. In contrast, in the French and English versions, the female athletes scored higher than male athletes on intrinsic motivation. These differences may be due to variables such as cultural differences, age, sports type, or performance level.

The present study presents some limitations. One of them was the fact that athletes that belon-

ged to different sports settings, clubs from distinct goals and also athletes from different performance levels composed the sample. Other limitations were related to facts like the there was not a total control with the social desirability to athletes response and the place when data was gathered (some times during training but also during competition) in order to reach the necessary number of subjects.

We suggest future studies comparing athletes from different sports, different performance levels, gender comparisons, different social settings and also researches involving athletes form different countries using the SMS as an instrument. Moreover, the self-determination theory seems to be directly related to burnout (Cresswell & Eklung, 2005a, 2005b) what opens new research fields using it to help the evaluation and control of over-training and burnout.

Consequently, the SMS version in Portuguese can be considered an adaptation to the English version and the results partially supporting the reliability and validity of the scale. These results justify its use in different sports and research settings aiming the motivation evaluation.

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Escala de motivação esportiva (sms-28)

Porquê você pratica esporte?

Usando a escala abaixo, favor indicar em que grau cada um dos items seguintes correspondem a um dos motivos pelos quais você atualmente pratica seu esporte.

	Não corresponde em nada	Corresponde um pouco		Corresponde medianamente		Corresponde muito	Corresponde exatamente
Porque você pratica o seu esporte?							
1. Pelo prazer que sinto de vivenciar experiências emplogantes.	1	2	3	4	5	6	7
2. Pelo prazer que sinto em conhecer mais sobre o esporte que pratico.	1	2	3	4	5	6	7
3. Eu costumava ter bons motivos para praticar esporte, mas agora estou me perguntando se eu devo continuar a praticá-lo.	1	2	3	4	5	6	7
4. Pelo prazer de descobrir novas técnicas de treinamento.	1	2	3	4	5	6	7
5. Eu não sei mais. Tenho a impressão de ser incapaz de ter sucesso nesse esporte.	1	2	3	4	5	6	7
6. Porque o esporte me permite ser respeitado pelas pessoas que conheço.	1	2	3	4	5	6	7
7. Porque, na minha opinião, o esporte é uma das melhores maneiras de conhecer pessoas.	1	2	3	4	5	6	7
8. Porque sinto muita satisfação pessoal quando domino algumas técnicas de treinamento dífíceis.	1	2	3	4	5	6	7
9. Porque é absolutamente necessário praticar esporte se uma pessoal deseja estar em forma.	1	2	3	4	5	6	7
10. Pelo prestígio de ser um atleta.	1	2	3	4	5	6	7
11. Porque o esporte é uma das melhores maneiras que escolhi para desenvolver outros aspectos pessoais.	1	2	3	4	5	6	7
12. Pelo prazer que sinto quando melhoro alguns dos meus pontos fracos.	1	2	3	4	5	6	7
13. Pela emoção que sinto quando estou realmente envolvido na atividade.	1	2	3	4	5	6	7
14. Porque eu devo praticar esporte para me sentir bem.	1	2	3	4	5	6	7
15. Pelo satisfação que sinto quando estou melhorando minhas habilidades.	1	2	3	4	5	6	7
16. Porque as pessoas com quem convivo, acham que é importante estar em forma.	1	2	3	4	5	6	7

17. Porque é uma boa maneira para aprender muitas coisas que podem ser úteis para mim em outras áreas da minha vida.	1	2	3	4	5	6	7
18. Pelas intensas emoções que sinto praticando o esporte que gosto.	1	2	3	4	5	6	7
19. Já não está tão claro para mim; na verdade, não acho que meu lugar é no esporte.	1	2	3	4	5	6	7
20. Pelo prazer que sinto ao realizar certos movimentos difíceis.	1	2	3	4	5	6	7
21. Porque me sentiria mal se não estivesse ocupando meu tempo para praticar esporte.	1	2	3	4	5	6	7
22. Para mostrar a outras pessoas como sou bom no meu esporte.	1	2	3	4	5	6	7
23. Pelo prazer que sinto quando aprendo técnicas de treinamentos que nunca havia tentado antes.	1	2	3	4	5	6	7
24. Porque o esporte é uma das melhores maneiras para manter boas relações com meus amigos/as.	1	2	3	4	5	6	7
25. Porque gosto da sensação de estar totalmente envolvido na atividade.	1	2	3	4	5	6	7
26. Porque eu devo praticar esportes regularmente.	1	2	3	4	5	6	7
27. Pelo prazer de descobrir novas estratégias que me levem a um melhor rendimento.	1	2	3	4	5	6	7
28. Me pergunto com frequência; parece que não consigo atingir os objetivos aos quais me propus	1	2	3	4	5	6	7

# 2, 4, 23, 27	Intrinsic motivation - to know
# 8, 12, 15, 20	Intrinsic motivation - to accomplish
# 1, 13, 18, 25	Intrinsic motivation - to experience stimulation
# 7, 11, 17, 24	Extrinsic motivation - identified
# 9, 14, 21, 26	Extrinsic motivation - introjected
# 6, 10, 16, 22	Extrinsic motivation - external regulation
# 3, 5, 19, 28	Amotivation