

Confirmatory factor analysis of the Brief Resilience Scale for Brazilian athletes

Análisis factorial confirmatorio de la Brief Resilience Scale para atletas Brasileños

Análise fatorial confirmatória de Brief Resilience Scale para Atletas Brasileiros

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Abstract: In general studies of resilience, the traumatic events, stressors and risks tend to be events that astonish the person. In the sports setting, it is not always true, since athletes actively seek for challenging situations. The pressure to perform at a high standard, worries about job security and injury, difficulties balancing sport and social life commitments, lack of coach feedback, lack of social support in competition and training are some specific stressor in sports settings. The aim of this study was to adapt cross-culturally and examine the psychometric properties of the Brief Resilience Scale (BRS) for Brazilian athletes. Following the cross-cultural adaptation of the original English scale, data were collected from 330 athletes (18 - 44 years of age) of both sexes. The original model of the scale was tested, with confirmatory factor analysis, using LISREL software (version 8.51). A satisfactory fit for the Brazilian model with one factor and six items was found ($\chi^2 = 18.32$, $p < .001$; RMSEA = .07; GFI = .993; AGFI = .97; NFI = .979; CFI = .993; NNFI = .986; $\chi^2 / Df = 2.61$), replicating the original structure of the scale. Satisfactory evidence of construct validity and internal consistency were also generated through analysis of factor loadings, t-values, Cronbach's alpha, and construct reliability tests. The BRS appears to be a valid and reliable scale to assess resilience among Brazilian athletes.

Keywords: Resilience; Brazil; Athletes; Psychometrics

Resumen: En estudios generales de resiliencia, los eventos traumáticos, estresores y riesgos tienden a ser eventos que asombran a la persona. En el ámbito deportivo, esto no siempre es cierto, ya que los atletas buscan activamente situaciones desafiantes. La presión para desempeñarse con un alto nivel, las preocupaciones sobre la seguridad y lesiones en el trabajo, las dificultades para equilibrar los compromisos deportivos y sociales, la falta de *feedback* de los entrenadores, la falta de apoyo social en la competición y la formación. El objetivo de este estudio fue adaptarse culturalmente y examinar las propiedades psicométricas de la *Brief Resilience Scale* (BRS) para atletas brasileños. Después de la adaptación transcultural de la escala original en inglés, se recogieron datos de 330 atletas (18-44 años) de ambos sexos. El modelo original de la escala fue probado, con análisis factorial

confirmatorio, utilizando el software LISREL (versión 8.51). Se encontró un ajuste satisfactorio para el modelo brasileño con un factor y seis ítems ($\chi^2 = 18.32$, $p < .001$; RMSEA = .07; GFI = .993; AGFI = .97; NFI = .979; CFI = .993; NNFI = .986; $\chi^2 / Df = 2.61$), replicando la estructura original de la escala. También se generaron pruebas satisfactorias de validez del constructo y la consistencia interna a través del análisis de las cargas de factores, los valores los tests alfa de Cronbach y las pruebas de confiabilidad del constructo. El BRS parece ser una escala válida y confiable para evaluar la resiliencia entre atletas brasileños.

Palabras clave: Resiliencia; Brasil; Atletas; Psicometría

Resumo: Em estudos gerais sobre resiliência, os eventos traumáticos, estressores e riscos tendem a ser eventos que surpreendem o sujeito. No cenário esportivo isso nem sempre é verdade, já que os atletas ativamente procuram por situações desafiadoras. A pressão para rendimento em alto nível, preocupações com a carreira e lesões, dificuldades em equilibrar os compromissos da vida social e do esporte, falta de *feedback* do técnico, falta de suporte social nas competições e treinamentos são alguns dos estressores específicos do esporte. O objetivo desse trabalho foi adaptar transculturalmente e examinar as propriedades psicométricas da *Brief Resilience Scale* (BRS) para atletas Brasileiros. Após a adaptação cultural da escala, os dados foram coletados em 330 atletas (18-44 anos de idade) de ambos os sexos. O modelo original da escala foi testado, usando-se análise fatorial confirmatória, por meio do *software* LISREL (Versão 8.51). Um ajuste satisfatório para o modelo brasileiro com um fator e seis itens foi encontrado ($\chi^2 = 18.32$, $p < .001$; RMSEA = .07; GFI = .993; AGFI = .97; NFI = .979; CFI = .993; NNFI = .986; $\chi^2 / Df = 2.61$), replicando o modelo original da escala. Evidências satisfatórias de validade de constructo e confiabilidade interna também foram geradas, através da análise das cargas fatoriais, T-valores, dos testes de alpha de Cronbach e de confiabilidade de constructo. A BRS parece ser uma escala válida e confiável para avaliar a resiliência entre atletas brasileiros.

Palavras chave: Resiliencia; Brasil; Atletas; Psicometria

Initially derived from the Physics, as the ability to resist the external forces without deformation (Munist, 1998), resilience is currently understood in a broad perspective (Salim, Wa-

dey & Diss, 2015). In psychology, resilience has been treated as both a trait and a process (Russel, 2015).

As a trait, resilience encompasses personal characteristics as easy temperament, extraversion, introspection, independence, social skills, creativity, sense of morality, positive affect, high self-esteem, spirituality, planning skills, hardness,

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and sense of humor (Bonanno, 2004; Campbell-Sills, Cohan & Stein, 2006; Fletcher & Sarkar, 2013; Mellilo & Ojeda, 2005; Zautra, Johnson & Davis, 2005). Under the trait perspective, resilience is commonly defined as “*the personal qualities that enables one to thrive in the face of adversity*” (Connor & Davidson, 2003, p.76), being accepted that the resilient traits will influence how the person evaluates the risk and respond to them (Fletcher & Sarkar, 2013). On the other hand, the process perspective considers resilience as a “*dynamic process encompassing positive adaptation within the context of significant adversity*” (Luthar, Cicchetti & Becker, 2000, p.543). The process perspective assumes that influence of the personal characteristics will vary according to the situation and the time (Davydov, Stewart, Ritichie, & Chadiou, 2010) and the answer for a stressor/risk is essentially a process developed in the context of person-environment interaction (Morgan, Fletcher & Sarkar, 2013). In resume, trait perspective assumes that, in any context, personal characteristics will favor a resilience response. On the other hand, the process perspective consider the situation and the possible answers that the person could deliver in that specific scenario, and hence, an resilience response may or not occur (Connor & Davidson, 2003; Morgan, Fletcher & Sarkar, 2013).

Despite the differences between the trait and process perspectives, they have, at least, three common points. Firstly, the presence of some personal characteristics (or promotive factors) that enable the person to be resilient – as a sense of humor, spirituality, hardness. Secondly, a need for social support or for a significant other. Finally, the presence of a risk or a stressor to change the original course of the development and start the resilience process (Cyrulnik, 2004). Must be emphasized that resilience is more than overcoming a challenge, a risk or stress: it is, mainly, a change in the original development path, which was disrupted by an acute or chronic stressor (Cyrulnik, 2004, 2005). The resilient person is not invulnerable, not necessarily happy or successful (Cyrulnik, 2013).

In general studies of resilience, the traumatic events, stressors, and risks tend to be events that astonish the person. In the sports setting, it is not always true, since athletes actively seek for challenging situations (Sarkar & Fletcher, 2014). The pressure to perform at a high standard, worries about job security and injury, difficulties balancing sport and social life commitments, lack of coach feedback, lack of social support in competition and training are some specific stressor in sports settings (McKay, Niven, Lavalley & White, 2008). The ability to overtake trauma or stressors could be consider a pre-requisite for excellence in sport settings (Hardy, Jones & Gould, 1996) since resilience has been associated with higher sport achievement, higher psychological well-being, lower psychological distress, higher optimism, higher purpose of life, lower pessimism, lower negative interactions,

higher social support, higher coping strategies (i.e.: acceptance, active coping, humor, planning and positive reframing), lower anxiety, lower depression, lower negative affect, higher positive affect and lower perceived stress, to name some of the recent finds (Galli & Gonzales, 2015; García Secades, Molinero, Ruíz Barquin, Salguero, Vega & Marquez, 2014; Hosseini & Besharat, 2010; Lu, Lee, Chang, Chou, Hsu, Lin & Gill, 2016; Nezhad & Besharat, 2010; Vitali, Bortoli, Bertinato, Robazza & Schena, 2014). Evidence also showed an effect of resilience on achievement, psychological well-being and distress and burnout syndrome in sport (Housseini & Besharat, 2010; Lu et al., 2016).

In sports settings, shorter scales seem to be advantageous, since the time for evaluation and the disposition of the athletes to answer can be scarce (Murphy & Tammen, 1998). Despite the fact that shorter scales address in a more narrow perspective the construct under evaluation, they could also minimize the answer time, participant tiredness and loss of information – caused by missing answers (Credé, Harms, Niehorster, & Gaye-Valentine, 2012). Among the current resilience psychometric measures, the Brief Resilience Scale (BRS; Smith, Dalen, Wiggins, Tooley, Christopher, & Bernard, 2008) has a potential reliable use in the sports setting. BRS is a short unidimensional scale, with six items, created to evaluate the ability to bounce back from adversity. There are three positives and three negatives items, designed to reduce social desirability and response bias (Smith et al., 2008).

Brazil experienced a unique sports climate, hosting a sequence of international sport events since 2007, closing with the 2016 Olympic and Paralympic Games. The goals established for the Olympic and Paralympic Games were to be among the tenth and fifth countries on medal counting, respectively. Athletes carried huge expectations, intensified after the failure of the Brazilian Football team in the 2012 World Cup. Unfortunately, none of the established goals were achieved, neither by the Olympic and Paralympic Brazilian Teams. Giving this scenario, Brazilian athletes' resilience should be followed close by the coaches and sports psychologists, to identify their potential to bounce back and to support the pressure, to work on their resilient potential for the upcoming competitions.

The present study sought to examine the factor structure of the Brazilian Portuguese version of BRS and provide evidence of construct validity and internal reliability for a sample of athletes. The following hypotheses were assumed for the nomological approach: H1 = There will be a positive association between time of sports practice, and the resilience score since the sports practice can contribute to the resilience development (Balaguer & Castillo, 2002). H2 = The score of resilience will vary according to the self-evaluation of performance, being a poor performance already recognized

as a significant adversity (Galli & Vealey, 2008). H3 = The score of resilience will vary according to the perception of financial security status, being poverty already recognized as an adversity (Davidson, Kitzinger & Hunt, 2006). H4 = The score of resilience will vary according to the marital status, being the presence of a significant other recognized as a valuable resource for the resilience process (Cyrulnik, 2004).

Method

Participants

The sample of this study consisted of 330 participants, being 41.8% females ($n = 138$), ranging in age from 18 to 60 years ($M = 25.77$, $SD = 7.14$) with a mean time of sports practice of 11.40 years ($SD = 7.08$). Regarding the level of competitiveness, 10% were beginners, 53% were skilled athletes, 13.1% were elite national athletes and 23.9% were elite international athletes. The majority of participants, 57.6%, described themselves in a romantic relationship – (dating or married) or single (40.3%), while 1.8% were divorced, and .03% was a widower. Regarding educational qualifications, 8.2% had completed primary education, 28.5% had completed secondary education, 52.7% had an undergraduate degree, and 10.6% had a further degree or specialist diploma. The sample was recruited among the Brazilian Army elite athletes ($n = 82$, 24.84%) and among athletes competing at the 59th Regional Games of São Paulo ($n = 248$, 75.16%). Data were collected from cities in the states of São Paulo and Rio de Janeiro, to attain a more representative sample of Brazilian athletes.

Materials

Brief Resilience Scale (BRS; Smith et al., 2008). The 6-item BRS is a measure of resilience, where items are rated on a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree). Items 2, 4 and 6 are negatively worded and should have their scores reversed. Higher scores indicate higher prone to the capacity to bounce back from adversity.

Brazilian version of Toronto Alexithymia Scale -20 items (TAS-20; Balbinotti & Wiethaeuper, 2013). The TAS-20 is a self-report scale was designed as a measure of alexithymia. The Brazilian version of TAS-20 had a satisfactory adjustment ($\chi^2/df = 3.47$; $GFI = .87$; $AGFI = .85$; $RMSEA = .06$), confirming the original three-factor structure: (1) Difficulty Describing Feelings (items 2, 4, 7, 12 and 17); (2) Difficulty Identifying Feelings (items 1, 3, 6, 11, 9, 13 and 14); and (3) Externally-Oriented Thinking (Items 5, 8, 10, 15, 16, 18, 19 and 20). Items are rate on a 5-point Likert scale (1=strongly disagree, 5=strongly agree). Items 4, 5, 10, 18 and 19 are score reversed. The sum of the total score can indicate the possibility of the person to have alexithymia, based on a cutoff scoring, being:

equal to or less than 51 points = non-alexithymia, scores of 52 to 60 = possible alexithymia, and equal to or greater than 61 = alexithymia. For the present sample, Cronbach alpha was .78 for factor 1, .70 for factor 2, and .36 for factor 3, hence, the latter was excluded from the statistical analysis.

Demographics. Participants self-reported their demographic information, namely age, highest educational qualification, marital status, level of competitiveness, and self-evaluation of actual performance (“Regarding your actual performance, do you self-evaluate as 1 = much below average, 2 = below average, 3 = average, 4 = above average, 5 = well above average”).

BRS cross-cultural adaptation procedures

Brazilian Portuguese version of the BRS was prepared based on the guidelines of Brislin (1970). First, the scale was translated into Brazilian Portuguese by a native Portuguese speaker (T1). Second, two back-translations were made by two independent translators (BT1, BT2) (English-speaking natives with Brazilian Portuguese proficiency) who had no knowledge of the original instruments or aspects of resilience. Third, all the versions (T1, BT1, BT2) were analyzed by the translator, back-translators, an expert on scale development, a linguist, and a sports psychologist. They discussed the items to ensure a clear pre-test version, equivalent to the original regarding semantics, language, culture, and concept (Herdman, Fox-Rushby, & Badia, 1998).

The pre-test version was then presented to 5 participants (age range 18-39 years) recruited among elite and non-elite athletes from Brazilian Army. Each participant completed the pre-test scale and, following this, took part in an interview to verify item and instruction comprehensibility, layout adequacy, and congruence between the desired answer and indicated answer (which was especially important for negative items and situations of double negatives). The pre-test indicated no need for revision. Through this process, the Brazilian Portuguese version of was ready for data collection for the present psychometric study.

Procedures

The original author of BRS gave his agreement for the present study, and ethical approval was obtained from the relevant university ethics committee. The recruitment of participants was non-probabilistic, and the researchers visited the Brazilian Army Commission of Sports Quarter and the 59th Regional Games of São Paulo. Researchers informed the participants that the aim of the study orally. Those who wanted to take part of the study received the pack of questionnaires to be answered in quiet and private room. A consent form explained the procedures and objectives of the study, and it

was read and signed by all participants. Each respondent took approximately 15 minutes to complete the survey. All participants took part in voluntary basis and were not remunerated for participation.

Statistical analysis

To prepare the data for CFA analysis in the PRELIS^{TM2} version of the LISREL system, the listwise deletion criterion was adopted for missing data – resulting in the elimination of cases with missing answers (Jöreskog & Sörbom, 1999). After generating the PRELIS^{TM2} file, the SIMPLIS model was used, which is an encoding of the LISREL system. CFA was then conducted, making it possible to evaluate the parameters of the construct of the measuring model. Given the fact that our data were not normally distributed, to estimate the models, the Unweighted Least Square Method was used (Garson, 2006).

Because the value of the standardized chi-square is inflated with large samples and values less than 5.0 do not characterize the adjustments (Maruyama, 1998), we considered the following fit indices for the adjustment of models: Goodness-of-Fit Index (GFI), Adjusted Goodness-of-Fit Index (AGFI), Normed Fit Index (NFI), Non-normed Fit Index (NNFI), and Comparative Fit Index (CFI). According to the literature (Hair et al. 2009), these indices should be equal to or above .90. Also considered was the Root Mean Square Error of Approximation (RMSEA), whose established value of acceptance is below .08

To analyze the measurement model, we examined construct validity (discriminant and convergent) and internal consistency. The latter was determined by Cronbach's alpha test (Hair et al., 2009). Values greater than or equal to .70 are acceptable.

To establish the convergent validity, t-values and the factorial loadings of the observable variables were analyzed. Item factorial loadings greater than .50 were preferable; however, .40 was deemed acceptable (Bowen & Guo, 2012; Hair et al., 2009). T-values greater than or equal to 1.96 were considered

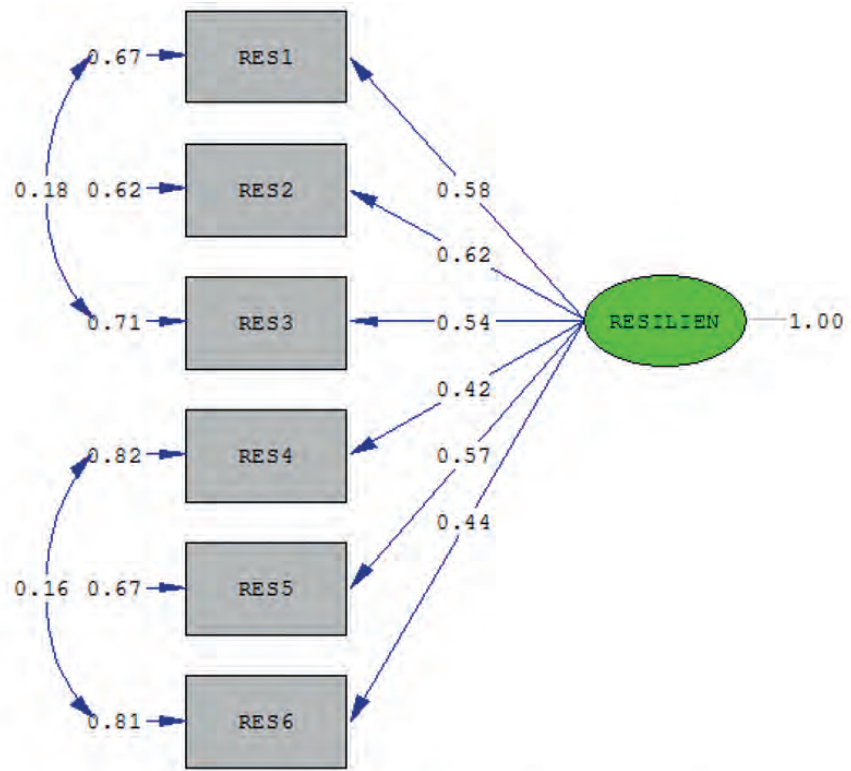
acceptable (Garver & Mentzer, 1999). Also, construct reliability, as an indicator of convergent validity, was calculated. Construct reliability is given by the formula: (squared sum of the standardized factor loading) / (squared sum of the standardized factor loading + the sum of the measurement error of the indicator). Values greater than or equal to .70 are acceptable (Hair et al., 2009).

To evaluate the discriminant validity, we examined the association (expecting for non-significant or negative) between TAS-20 factors and BRS total score. Finally, the hypotheses were also tested with the adequate statistical tests, considering a confidence interval of 95%. The statistical software used were SPSS 15 and LISREL 8.51.

Results

BRS factor structure

Mean scores, factor loadings, and t-values are described in table 1. Initial results showed poor adjustments ($\chi^2 = 47.62$, $p < .001$; RMSEA = .114, GFI = .984, AGFI = .962, NFI = .947, CFI = .968, NNFI = .947, $\chi^2/df = 5.29$). Following the chosen parameter to proceed with modifications to the model, we proceeded with the analysis of factor loading, residual and modification indices. Items 4 ($\lambda = .45$) and 6 ($\lambda = .46$) had the lower, but acceptable factor loadings. The examination of modification indices revealed two modifications that are meaningful both conceptually (similar content) and statistically (regarding a relatively strong improvement in the model's fit). These indices suggest modifying the model by freely estimating the associations between error terms of the items 4 and 6, and 3 and 1. To preserve the content validity of the scale and keep the original structure, these suggestions of modification were accepted. Following these changes, better adjustment of this model was achieved ($\chi^2 = 18.32$, $p < .001$; RMSEA = .07, GFI = .993, AGFI = .979, NFI = .979, CFI = .993, NNFI = .986, $\chi^2/df = 2.61$), replicating the original structure of the scale (Figure 1).



Chi-Square=18.32, df=7, P-value=0.01060, RMSEA=0.070

Figure 1. Structural Model of Portuguese Brazilian version of Brief Resilience Scale.

Internal Consistency, Discriminant and Convergent Validity of the BRS

Cronbach’s alpha for the BRS was $\alpha = .72$ and the elimination of any items could improve it. In respect of convergent

validity, all factors loadings were above .40, being $\lambda = .42$ (item 2) the lower and $\lambda = .62$ the higher (item 2). All t -values had statistical significance, being above of 1.96. Also, the value of construct reliability was .70, evidencing that all six items were measuring a single latent variable (Table 1).

Table 1. Mean score, factor loadings and t -values for Brazilian version of BRS items.

Items	Mean score	Standard deviation	Factor loading	T -value
1 - Eu costumo dar a volta por cima rapidamente depois de situações difíceis. [I tend to bounce back quickly after hard times]	3.76	.89	.58	9.80
2 - Eu tenho dificuldade de passar por situações estressantes. [I have a hard time making it through stressful events.] (R)	3.40	1.02	.62	11.48
3 - Eu me recupero rápido de uma situação estressante.[It does not take me long to recover from a stressful event.]	3.47	.96	.54	9.16
4 - É difícil para eu reagir quando alguma coisa ruim acontece.[It is hard for me to snap back when something bad happens.] (R)	3.50	1.03	.42	8.42
5 - Geralmente, eu passo pelas dificuldades sem grandes problemas. [I usually come through difficult times with little trouble.]	3.27	1.01	.54	11.11
6 - Eu costumo demorar bastante tempo para me recuperar dos contratempos da minha vida.[I tend totake a long time to get over set-backs in my life] (R)	3.77	.91	.44	8.70

Note: (R) = reversed score item.

Regarding discriminant validity, the total score of BRS showed significant and negative associations with the score of the factor "Difficult in identify feelings" from TAS-20, $r_s = -.43$, and with the score of the factor "Difficult in describing feelings," $r_s = -.40$. These are evidence that the constructs are correlated, but are essentially opposite, and the scales measure different constructs.

Finally, for the BRS, a Kruskal-Wallis test showed score differences among athletes with a different level of competitiveness, $\chi^2(330, 3) = 2.580$, $p < .0001$. The Mann-Whitney test with Bonferroni correction ($\alpha = .008$) showed that the differences are between beginners (mean rank = 29.12) and national elite athletes (mean rank = 45.70), $U = 400.00$, $p = .001$, $r = .37$, between beginners (mean rank = 39.50) and international elite athletes (mean rank = 63.6), $U = 742.50$, $p < .0001$, $r = .34$, between local skilled (mean rank = 103.15) and national elite athletes (mean rank = 135.34), $U = 2651.50$, $p = .003$, $r = .21$ and between beginners (mean rank = 116.44) and international elite athletes (mean rank = 152), $U = 4977.00$, $p < .0001$, $r = .22$.

Nomological approach and further evidence

In concern of the first hypothesis of the study, predicting association among resilience and years of practice, the Spearman tested a positive association, $r_s = .23$, $p < .001$.

The second hypothesis, the third hypothesis, and fourth hypothesis were all rejected, $\chi^2(330, 4) = 7.11$, $p = .13$; $\chi^2(330, 3) = 7.39$, $p = .06$; $U = 11565.00$, $p = .06$, $r = .10$., respectively hence, there is no difference in BRS score based on self-evaluation of the actual performance, nor regarding perception of financial security and neither regarding being in a romantic relationship (dating or marry) or single (bachelor, a widower and divorced), respectively.

Discussion and conclusion

The aim of this study was cross-cultural adapt, run the confirmatory factor analysis and generate psychometrics evidence for the Brief Resilience Scale in a sample of Brazilian athletes. The transcultural adapt work was carefully conducted and was guided by a well-established guideline (Brislin, 1970), covering the two main steps: the back translation and the pre-test (Weeks, Swerissen & Belfrage, 2007). The translated items showed clarity on their statements and great comprehension.

Regarding the factorial structure, all six items remained on the Brazilian Portuguese version of BRS, and the one-factorial structure was confirmed, with satisfactory adjustment indices (RMSEA = .07, GFI = .993, AGFI = .979, NFI = .979, CFI = .993, NNFI = .986, $\chi^2/df = 2.61$). Also, evidence of internal reliability, convergent, and discriminant validity were

generated. About the latter, the negative association between BRS score and the two factors of TAS-20 eligible for analysis in this study (it is worth to mention that one a factor of TAS-20 had lower internal reliability value for our sample) confirmed previous indication that persons with higher levels low-self awareness will fail to respond to the distress. Hence, there will be a "delay" in the development of resilience (Armstrong, Galligan, Critchley, 2011).

Different from the original scale, the Brazilian version accepted the error of covariance in two pairs of items: 3 and 1, 6 and 4, as suggested by the LISREL's modification indices. Common causes for this practice include item redundancy (caused by a similar content or social desirability) and/or an omission of an exogenous factor (Schumacker & Lomax, 2004). The acceptance of covariance error should have theoretical support, rather than a purely statistical reason (to enhance the model adjustment; Silvia & Maccallum, 1988). It is unlikely that social desirability is a factor for error covariance since we ensured conditions for data collection to reduce this bias (voluntary and anonymous participation). It is also unlikely that an ignored latent variable (factor) was missing on the scale since the construct under investigation were well-defined and theoretically limited. Also, the analyzed model was, in one hand, already proposed and investigated by previously study and, on the contrary, the item generation procedure was based on expertise knowledge. It is, therefore, possible that the existence of error covariance was due to similar content between items, as already seen in other cases of Brazilian Portuguese psychometric studies (Campana, Swami, Tavares, & Silva, 2013).

We sought to add to the growing body of literature examining resilience in general and in the sports context, by exploring four hypotheses in this study, advancing the psychometric evidence. The first hypothesis, about the association of time of sports practice and resilience score, make sense in the light of previous statements that declared the sports practice as a source of resilience development (Galli & Gonzalez, 2015, García Secades *et al.*, 2014, Gilligan, 1999; Morgan, 2010, Sarkar & Fletcher, 2014). Of course, the quality of the sports experience was not investigated, only the time already spent doing sport. Even so, this result adds more evidence for the argument that long-term sports adherence could be positive for resilience development.

The present data did not confirm the hypothesis that sports performance has an effect on resilience (Galli & Vealey, 2008), showing no differences among different levels of performance self-evaluation. The cross-sectional study approach should be a reason for that result since we were only able to compare group differences. Also, because the evaluation of risk and the resources to bounce back are extremely singular, the better approach for this issue should be a longitudinal design, in which the self-evaluation of performance in diffe-

rent moments could confirm the hypothesis, and it should be explored in a future study.

The hypotheses regarding the variance on resilience score according to financial security and marital status, were both rejected by a narrow margin ($p = .06$) leading us to speculate if a bigger sample could give a different outcome. Both hypotheses make sense with the literature on resilience. Poverty and the risk of being poor are well recognized as a condition of vulnerability (Friedli, 2009). As well, the presence of a significant other is recognized as a primary condition for the development of resilience (Cyrulnik, 2004, 2005). Of course, this significant other is not necessarily the love partner, but this chosen person could indeed assume this role. Of course, further researches about these topics are necessary, and such researches could explore the perception of risk of the financial condition, quality and the length of the relationship for a better understanding of the differences and similarities between the variance of financial and marital status.

Some further limitations of the present study should be considered. First, despite our effort to vary the data collection locations and level of competitiveness among the athletes; it is true that the sample is non-probabilistic. Since resilience is considered as an important factor for the athlete to overcome the inherent challenges of the sport setting (Hardy, Jones & Gould, 1996), it would be interesting to have BRS for Brazilian adolescents and senior athletes as well. In a similar vein, future studies should also examine the psychometric properties of

the Brazilian BRS among specific samples in which resilience is a prominent importance, as Paralympic athletes. Should also investigate the relations and associations that resilience could have with other relevant constructs in the sports context, such as exercise dependence, anabolic steroid use, and social physique anxiety. Also, could be explored the relationship between resilience and relevant traits of successful athletes. Similarly, it would also be useful to screen specific risk factors in Brazil, and examine the variance of BRS in function with these factors.

Practical applications

The present study provides evidence for the psychometric properties of the Brazilian Portuguese version of BRS, providing a short and reliable scale for the coaches and researchers to systematically track the athletes' ability to bounce back from sports adversity. In practical terms, the routine use of the scale could give to the coaches a perspective of resilience development of his/her athletes, hence, providing cues for strategies that should be addressed on mental training, to achieve a higher resilient profile. Finally, regarding research perspectives, we hope that the availability of BRS will allow for more systematic investigations of resilience in sports not only in Brazil, also raising the possibility of conducting systematic cross-cultural research.

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