
Validation and cultural adaptation of the Sport Confidence Inventory (SCI) for Brazilian adolescent athletes

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Abstract

The objective of this study was to translate, adapt and validate the Sport Confidence Inventory (SCI) to Brazilian Portuguese. The final application of the SCI-BR occurred with 540 adolescent athletes involved in a high-level sports competition. In addition, Factorial Exploratory Analysis (FEA) (n=260) and Confirmatory Factorial Analysis (CFA) (n=280) were conducted in approximately 50% of the total sample for each analysis group. High internal consistency ($\alpha = 0.861$), reproducibility (0.899) and content validity (CVC) for "language clarity" (0.796) and "practical relevance" (0.967) indexes were observed. In addition, two factors have been identified that explain the sport confidence construct in Brazilian adolescent athletes. In the CFA, it was observed adequate global indexes of fit to the model for the instrument from two factors (RMSEA=0.078; CFI=0.90; TLI=0.86; SRMR=0.062). With this, it is concluded that the translated SCI has adequate psychometric indicators for the evaluation of sport confidence in Brazilian adolescent athletes.

KEYWORDS: confidence, psychometrics, psychology, sports, adolescent.

Validação e adaptação cultural do Sport Confidence Inventory (SCI) para atletas adolescentes brasileiros

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Resumo

O objetivo deste estudo foi traduzir, adaptar e validar o Sport Confidence Inventory (SCI) para o português brasileiro. A aplicação final do SCI-BR ocorreu com 540 atletas adolescentes envolvidos em uma competição esportiva de alto nível. Além disso, foram realizadas Análise Fatorial Exploratória (AEF) ($n=260$) e Análise Fatorial Confirmatória (AFC) ($n=280$) em aproximadamente 50% da amostra total para cada grupo de análise. Observou-se alta consistência interna ($\alpha = 0,861$), reprodutibilidade (0,899) e validade de conteúdo (CVC) para os índices "clareza da linguagem" (0,796) e "relevância prática" (0,967). Além disso, foram identificados dois fatores que explicam o construto de confiança esportiva em atletas adolescentes brasileiros. Na AFC, observaram-se adequados índices globais de ajuste ao modelo para o instrumento a partir de dois fatores (RMSEA=0,078; CFI=0,90; TLI=0,86; SRMR=0,062). Com isso, conclui-se que o SCI traduzido possui indicadores psicométricos adequados para avaliação da confiança esportiva em atletas adolescentes brasileiros.

Palavras-chave: confiança, psicometria, psicologia, esportes, adolescente.

Validación y adaptación cultural del Sport Confidence Inventory (SCI) para deportistas adolescentes brasileños

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Resumen

El objetivo de este estudio fue traducir, adaptar y validar el Sport Confidence Inventory (SCI) para el portugués brasileño. La aplicación final del SCI-BR ocurrió con 540 atletas adolescentes involucrados en una competencia deportiva de alto nivel. Además, se realizaron Análisis Factorial Exploratorio (FEA) ($n=260$) y Análisis Factorial Confirmatorio (CFA) ($n=280$) en aproximadamente el 50% de la muestra total para cada grupo de análisis. Se observó alta consistencia interna ($\alpha = 0,861$), reproducibilidad (0,899) y validez de contenido (CVC) para los índices de "claridad del lenguaje" (0,796) y "relevancia práctica" (0,967). Además, se identificaron dos factores que explican el constructo confianza deportiva en atletas adolescentes brasileños. En el AFC se observaron adecuados índices globales de ajuste al modelo para el instrumento a partir de dos factores (RMSEA=0,078; CFI=0,90; TLI=0,86; SRMR=0,062). Con eso, se concluye que el SCI traducido tiene indicadores psicométricos para la evaluación de la confianza deportiva en atletas adolescentes brasileños.

Palabras-clave: confianza, psicometría, psicología, deportes, adolescente.

Introduction

Confidence has been identified as the most important psychological skill to define mental vigor by successful athletes (Vealey, 2009), beyond has a positive relationship with performance and experience in sport (Martin & Gill, 1991; Woodman & Hardy, 2003). In addition, according to Koehn, Pearce, and Morris (2013), confidence in sport is characterized by a transitory and volatile state and is essential for athletes to feel confident in and remain confident throughout competitions. As a way of stimulating the increase in the self-confidence level of athletes, researchers in the area have indicated the use of specific techniques that can be applied by sports coaches and psychologists in training and competition environments (Mamassis & Doganis, 2004; Munroe-Chandler; Hall & Fishburne, 2008). Among these techniques, the use of imagery and self-talk is highlighted to increase confidence during the competitive season and to reduce confidence fluctuations in moments before competitions (Callow; Hardy & Hall, 2001; Hatzigeorgiadis et al., 2009).

Concerning the investigation of the confidence construct in sport, Hays et al. (2007) investigated through interviews the types of confidence of 14 British male and female elite athletes and verified that they attributed the sport confidence to the skill execution, achievement, physical factors (strength, speed and balance), psychological factors (goal setting, precompetitive routines, and coping with nervousness and expectations), superiority to opposition and tactical awareness (Hays et al., 2007; Hays et al., 2009). The results of the studies cited corroborate with the current multidimensional conception of the sport confidence construct, confirmed by the Vealey (2001) and Vealey and Chase (2008) integrative model, which define sports confidence as the athlete's belief in the ability to be successful in sports.

In order to explore the multidimensionality of the sport confidence construct for large samples of athletes of the most varied sports, competition levels and age ranges, studies were developed on the construction and validation of instruments to operationalize this variable quantitatively (Vealey, 1986; Manzo; Ilva & Mink, 2001; Vealey & Knight, 2003). In the 1980s, Vealey (1986) developed two instruments aimed at assessing confidence in sports, the "State Sport-Confidence Inventory" (SSCI; Vealey, 1986) and the "Trait Sport-Confidence Inventory" (TSCI; Vealey, 1986).

However, these two instruments presented one-dimensional characteristics (the SSCI assesses the state of sport confidence and the TSCI assesses the confidence trait in the sport). Later the conception of the sport confidence construct changed to a multidimensional vision, with the publication of the "Carolina Sport Confidence Inventory" (CSCI) (Manzo; Ilva & Mink, 2001) composed of the factors "dispositional optimism" and "perceived competence" and the "Sport Confidence Inventory" (SCI) (Vealey & Knight, 2003), composed of the factors "Physical skills and training", "Cognitive efficiency" and "resilience". The SCI development process went through several phases, such as a conceptual definition of sport confidence by experienced athletes, coaches and Sports Psychology specialists, a focus group with individual and collective sports athletes, confirmatory factorial analysis (CFA) and concurrent validation with dispositional anxiety and coping (Vealey & Knight, 2003).

According to the psychometric properties of CSCI and SCI instruments, Fogarty et al. (2016) verified that SCI was the only one between the two that discriminated the types of confidence between athletes of different levels of competition (international and regional athletes) and was pointed out as the most adequate instrument to measure individual differences in sports confidence. In addition, the authors pointed out that some of the SCI indicators presented loads in two or more factors, indicating a bias of discriminant validity to be deepened, especially in relation to the "cognitive efficiency" and "resilience" subscales.

In addition, in a study with the objective of analyzing the multidimensionality of the three-factor model of SCI in samples of 512 athletes and 1170 non-athletes of United States, it were observed a better overall indices of adjustment to the SCI model applied in the athletes sample (CFI (Comparative Fit Index) = 0.93; RMSEA (Root Mean Square Error of Approximation) = 0.09; SRMR (Standardized Root Mean Square Residual) = 0.06) compared with the non-athletes sample, (CFI = 0.91; RMSEA = 0.12; SRMR = 0.06) (Machida et al., 2017).

In Brazil, the SCI was applied in athletes from 12 to 22 years of soccer and gymnastics, with verification of different compositions of the construct for the subscales of each sport (Frischknecht; Pesca & Cruz, 2016). Considering the limitations verified in the validation of the SCI in the Frischknecht, Pesca and Cruz (2016) study, especially with regard to the choice of only two sports and the inclusion of adolescent and young adults athletes in the same analysis, it is believed that the improvement of the translation of this instrument and subsequent validation in representative samples of Brazilian adolescent athletes from the most varied sports, will fill the gap pointed for the Brazilian sport context.

For this purpose, instruments translated and adapted to the Brazilian culture and with adequate psychometric properties are necessary in order to provide reliable and consistent data. Thus, the objective of the present study was to translate, adapt and validate the Sport Confidence Inventory (SCI) to Brazilian Portuguese.

Method

Study participants

The population of this study consisted of 3152 Brazilian athletes from 14 to 19 years of age participating in the largest sports competition of Santa Catarina, in Curitiba, in July 2018. For the sample calculation, the Luiz and Magnanini (2000) criteria were adopted, with a confidence level of 1.96 (95% CI), tolerable error of 5%, prevalence of 50% (unknown outcome) and delineation effect of 1.5. In order to minimize possible losses related to possible refusals to participate in the study, 5% were added. Considering the population of 3152 athletes participating in the competition, the minimum sample size for a representative sample was 539 athletes.

For the constitution of the sample, the delegations were randomly selected according to the region (Greater Florianópolis, Vale do Itajaí, North, South, West and Serra region) and size (small, with up to 200 athletes,

average of 200 to 499 athletes and large, with more than 500 athletes). As inclusion criteria all the athletes belonging to the largest delegations from each region were invited to participate in the research. For this study, male and female adolescents athletes between the ages of 14 and 19 were considered eligible. As exclusion criteria athletes who did not respond to SCI completely and/or were younger than 14 years of age were excluded from the sample. Nine participants were excluded, four of whom were under the age of 14 and five were no longer answered by at least one SCI question, which resulted in a representative sample of 540 athletes belonging to collective and individual sports.

The participants of the study were invited to participate voluntarily, so that athletes under the age of 18 who agreed to participate, signed the Free and Informed Assent Form and had the Free and Informed Consent Form signed by the parents or coaches, respecting the Guidelines and Norms Regulating Research on Human Beings, in accordance with Resolution 466/12 of National Health Council (BRASIL, 2012). In addition, the study was approved by the Ethics Committee in Research with Human Beings of the State University of Santa Catarina (Protocol number 2.776.501).

Evaluation Instruments

Sport experience, competitive level and sport type

Information on sport experience was obtained using the open-ended question "How long have you been practicing the sport?" Responses were recorded in years and months. Athletes were also asked about the type of sport they practiced (individual or team) and their highest competitive level (state, national, or international).

Sport Confidence

The original version of the SCI, with the three dimensions included 14 items, with questions 1, 4, 7, 10 and 13 referring to the "physical skills and training" domain; questions 2, 5, 8 and 11 refer "cognitive efficiency" domain; and questions 3, 6, 9, 12 and 14 refer to the "resilience" domain. This instrument is answered on a scale of 7 to 1 point, assigning from 7 (totally certain) to 1 (can't do it at all) (Vealey & Knight, 2003).

In the original questionnaire, the authors argue that the application of the instrument of sport confidence must be according to a specific time frame for respondents to base their responses. Thus, Vealey and Knight (2003) suggest different temporal frames of the measure of sport confidence, such as considering how the athlete feels at the time of the application, how he felt about a game or last season, how he feels about the next competition, game or season and how he usually feels about his abilities in his sport. The central question chosen regarding the temporality of the sport confidence that guided the questions of the instrument of the present study was: "Respond to each item based on how you TYPICALLY FEEL about your abilities in your sport."

Translation, back-translation and technical review

Initially the SCI authors were contacted and authorized the translation and adaptation of the instrument into the Portuguese language. From this, the transcultural translation and adaptation process of the instrument followed the proposal of Herdman et al. (1998), considering the phases of translation, back-translation, technical review, expert opinion of the area, focus group, test-retest and final application.

Initially, the original SCI translation of the English language was performed by two independent translators for Brazilian Portuguese, as Guillemín, Bombardier and Beaton (1993) suggest. The back-translations were carried out by two native English-speaking specialists, one specialist belonging to the area of analysis of the instrument and another not. After this phase, the instrument was evaluated by a committee responsible for the technical review, in which the objective was to produce the final version of the back-translation.

In the technical review phase, composed of four experienced researchers fluent in the English language, some modifications were made in relevant, inappropriate or ambiguous items.

Content validity

At this phase, the translated SCI-BR was sent for evaluation to six experts from the Physical Education and Human Movement Sciences fields to evaluate the content validity of the 14 items of the instrument. For the analysis of the 14 items of the instrument, the content validity technique was used for the evaluation of the questions of "language clarity", "practical relevance" and "theoretical relevance". To do so, the judges used a "likert" scale one to five points to assess the level of adequacy of language clarity, practical relevance and theoretical relevance of the instrument, being 1 = "Inadequate"; 2 = "Not very suitable"; 3 = "Acceptable"; 4 = "Suitable"; and 5 = "Very suitable". After the specialists completed their evaluations, the content validity coefficient (CVC) proposed by Hernández-Nieto (2002) was calculated.

In a complementary way, the experts were asked to evaluate the adaptation of the instrument through four questions: i) "In your perception, the instrument constitutes a valid indicative in our language and culture for the investigation of sport confidence for adolescent athletes aged 14 to 19 years? "; ii) "In your view, the issues are clear and relevant to the purpose of the instrument?"; iii) "In your perception the proposed heading for the questionnaire is adequate?"; and iii) "In your perception, the questionnaire questions can include both individual and collective sports athletes?" The response options could be: "Yes", "No" or "In parts".

Focus Group

In order to analyze the semantics and level of comprehension of the questions of the translated instrument, a focus group was conducted with four track and field athletes aged 15 to 19 years. The selection of this group was made considering the proximity of the researcher with the coaches team

and availability of the athletes. The questions were read one by one for the group and the youth were asked to explain their understanding regarding the issues.

Reproducibility

The SCI test-retest phase was performed with 33 male adolescent athletes aged 14 to 18 years, with a mean age of 15.03 (3.03) years, from track and field, volleyball and soccer sports with interval of seven days between the two applications. In this step, the same ethical procedures were followed for the application of the instrument with the large sample in the competition environment with the signing of the ethical terms for those who accepted to participate in the study.

Final Application

The final application of the instrument was performed before the athletes competed in their specific modalities. To that end, the heads and coaches of the largest delegations from each region of the State of Santa Catarina were contacted to explain the study. After the authorization of the persons responsible for the application of the research, the athletes were invited and those who agreed to participate signed the ethical terms and answer the research questionnaire

Data analysis

To analyze the data, it was used the Statistical Package for the Social Sciences (SPSS) Software for Windows version 20.0 and Stata v.13.1. In addition, descriptive analyzes of central tendency and dispersion were performed. Non-normality was verified in the data distribution and because of this, non-parametric analyzes were performed. The semantic content analysis was conducted by calculating the content validity coefficient (CVC) (Hernández-Nieto, 2002). The reproducibility was analyzed using the intra-class correlation coefficient (ICC) between the test and retest and the internal consistency was analyzed by the Cronbach alpha. In addition, the comparison between the means of the test and retest was performed through the Wilcoxon test.

The cut-off point used to determine satisfactory levels of "language clarity" and "practical relevance" was $CVC \geq 0.70$, as recommended by Casepp-Borges, Balbinotti and Teodoro (2010). In addition, the ICC indexes ≥ 0.51 and Cronbach's $\alpha \geq 0.70$ were considered adequate (Fermanian, 1984; Terwee et al., 2007). In addition, another measure of internal consistency was estimated for scales that quantify the construct, the McDonald's omega coefficient. (Ventura-León & Caycho-Rodríguez, 2017).

Regarding the validation of the instrument, the total sample ($n = 540$) was randomly divided into two samples with approximately 50% of subjects. Thus, in one group, was performed an Exploratory Factorial Analysis (EFA) ($n = 260$) and in another group, the Confirmatory Factorial Analysis (CFA) ($n = 280$). The EFA was performed by the factorial extraction method of the main axis, oblimin rotation, adopting coefficients of minimum commonality of 0.3 and considering factors with eigenvalues greater than 1.

In addition, the Kaiser-Meyer-Olkin (KMO) test was used to verify the suitability of the sample for the model, with values between 0.80 and 1.0 being considered adequate.

For the evaluation of the overall goodness-of-fit indicators, the CFA was conducted, in which it provides information about the degree of fit between the sample data and the proposed model. To that end, numerous indexes of global fit to the model were investigated, including the chi-square test (χ^2), the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the Standardized Root Mean Square Residual (SRMR) and the Root Mean Square Error of Approximation (RMSEA). In addition, for the estimation of CFA model, the Weighted Least Square estimation method (WLS) was used seeing that normality was not assumed (Acock, 2013).

In the present analysis, to obtain the appropriate model indicated by the adjustment indices, the cut-off criteria proposed by Hu and Bentler (1999) were considered. Thus, satisfactory fit indicators to the model include CFI and TLI values greater than 0.90 (Bentler, 1990) and SRMR and RMSEA values below 0.08 (Bentler, 1990; Browne & Cudeck, 1992). For all analyzes, a significance level of 5% was considered.

Results

Translation, back-translation and technical review

After the translation and back-translation analysis of the SCI, some important adaptations were made in order to improve the semantics and clarity of the SCI issues for the Portuguese language. In general, for all questions, the introductory word "you" has been deleted, seeing that each question complements the guiding question: "how right you are....". In addition, the expressions "bounce back from performing poorly" (question 3), "overcome a doubt" (question 9) and "manage your nervousness" (question 14) were adapted to: "overcome poor performance", "regain confidence" and "control nervousness" respectively. Such adaptations were necessary to maintain the clarity and understanding of the issues by adolescents without semantically compromising the original version of SCI.

Expert assessment and focus group

Based on the experts' suggestions, the words "absolute levels" were deleted in the heading of the instrument. In addition, the wording of questions 1, 3, 4, 8, 11 and 12 was supplemented by the words "in competitions" at the end. Finally, in question 1, next to the words "physical skills" were added: "(for example: to run, to swim, to jump)" and in question 7, next to the words "physical fitness" were added: "(for example, speed, force, resistance)". The adaptations made to the final version of the translated SCI were described in Table 1.

Regarding the focus group, none of the participants expressed doubts as to the understanding of the content and clarity of the questions and because of this, no suggestions for possible modifications were observed.

Table 1. Analysis of translation and back-translation of the issues of the instrument considering the supplementary question: "How certain are you that..."

Original	Translation	Back-translation	Final
1. you can execute physical skills necessary to succeed?	1. você pode executar habilidades físicas necessárias para ter sucesso?	1. you can execute physical skills necessary to succeed?	1. pode executar as habilidades físicas (por exemplo, correr, nadar, saltar) necessárias para ter sucesso nas competições?
2. you can keep mentally focused throughout the competitive event?	2. você pode manter o foco mental durante todo o evento competitivo?	2. you can maintain mentally focused throughout the competitive event?	2. pode manter o foco mental durante toda a competição?
3. you can bounce back from performing poorly to successfully execute your skills?	3. você pode voltar do mal desempenho a executar com sucesso suas habilidades?	3. you can come back from performing poorly to successfully execute your skills?	3. pode superar um mau desempenho para executar com sucesso suas habilidades nas competições?
4. your physical training prepared enough to succeed?	4. seu treinamento físico preparou você o suficiente para ter sucesso?	4. your physical training prepared enough to succeed	4. seu treinamento físico preparou você o suficiente para ter sucesso na competição?
5. you can successfully make critical decisions during competition?	5. você pode tomar decisões críticas durante a competição?	5. you can make critical decisions during competition?	5. pode tomar decisões críticas durante a competição?
6. you can regain your mental focus after a performance error?	6. você pode recuperar seu foco mental após um erro de desempenho?	6. you can recover your mental focus after a performance error?	6. pode recuperar seu foco mental após um erro de desempenho?
7. your physical fitness level will allow you to compete successfully?	7. seu nível de aptidão física permitirá competir com sucesso?	7. your physical fitness level will allow you to compete successfully?	7. seu nível de aptidão física (por exemplo, velocidade, força, resistência) permitirá competir com sucesso?

8. you can effectively use strategy needed to succeed?	8. você pode efetivamente usar a estratégia necessária para ter sucesso?	8. you can effectively use strategy needed to succeed?	8. você pode efetivamente usar a estratégia necessária para ter sucesso na competição?
9. you can overcome doubt after a poor performance?	9. você pode superar a dúvida após uma má performance?	9. you can overcome doubt after a bad performance?	9. você pode recuperar a confiança após um mau desempenho?
10. you can successfully perform the physical skills required in your sport?	10. você pode realizar com sucesso as habilidades físicas necessárias no seu esporte?	10. you can successfully perform the physical skills required in your sport?	10. você pode executar com sucesso as habilidades físicas necessárias no seu esporte?
11. you can maintain the mental focus needed to perform successfully?	11. você pode manter o foco mental necessário para ter sucesso?	11. you can keep the mental focus needed to succeed?	11. você pode manter o foco mental necessário para ter sucesso na competição?
12. you can overcome problems and setbacks to perform successfully?	12. você pode superar problemas e contratempos para executar com sucesso?	12. you can overcome problems and setbacks to perform successfully?	12. você pode superar problemas e contratempos para realizar um desempenho com sucesso na competição?
13. you have the physical preparation that is needed to compete successfully?	13. você tem a preparação física necessária para competir com sucesso?	13. you have the physical preparation needed to compete successfully?	13. você tem a preparação física necessária para competir com sucesso?
14. you can successfully manage your nervousness so that it doesn't hurt your performance?	14. você pode gerenciar com sucesso seu nervosismo para que isso não prejudique seu desempenho?	14. you can successfully manage your nervousness so that it doesn't harm your performance?	14. você pode controlar com sucesso seu nervosismo para que isso não prejudique seu desempenho?

Content validity

The content validity coefficients (CVC) of the translated SCI were 0.833 for the "language clarity" and 0.967 for the "practical relevance" and "theoretical relevance" requirements. Regarding the question about the

validity of the instrument for the Brazilian language and culture, 83.3% of the experts were answered "Yes" and 16.7% answered "In parts". In the question related to the clarity and relevance of the instrument, there were 50% "Yes" answers and 50% "In parts" answers and in the questions related to the suitability of the heading and application of the instruments in athletes of individual and collective sports, it was verified a total of 83.3% with "Yes" answers and 13.7% "In parts" answers".

Reproducibility

In this analysis we verified ICC of 0.870 (95% CI: 0.738-0.936) ($p < 0.001$). Moreover, at this same phase no statistically significant differences were observed in the central tendency values between the SCI-BR test-retest ($p = 0.346$).

Descriptive analysis

Regarding the sample of the final application, participated 540 adolescent athletes (52.4% male), aged 14 to 19 years old, with a mean age of 16.31 (1.15) years, belonging to the Handball (23.5%), Soccer (15.5%), Volleyball (13.9%), Track and Field (13.7%), Basketball (11.7%), Swimming (11.7%), Karate (2.4%), Taekwondo (2.2%), Judo (1.9%), Tennis (1.5%), Beach Volleyball (0.7%), Gymnastics (0.7%) and Cycling (0.6%).

In addition, the athletes competed mostly at the regional level (53.0%), belonged to team sports (65.4%) and had a mean of 5.17 (2.92) years of experience in the sport (Table 2).

Table 2. Descriptive analysis of the representative sample (n = 540)

Variables	Indices*
Age, years	16.31 (1.15)
Gender	
Male	283 (52.4%)
Female	257 (47.6%)
Competition level	
Regional	285 (53.0%)
National	164 (30.5%)
International	89 (16.5%)
Sport experience, years	5.17 (2.92)
Type of sport	
Individual	187 (34.6%)
Collective	353 (65.4%)

* Values expressed as mean and standard deviation for the numerical variables and in number and percentage considering gender, competition level and type of sport.

As far as the descriptive values of the translated SCI questions were concerned, the three highest scores mean were found on questions 1, 10 and 7 and the three lowest score means on questions 2, 5 and 14 (Table 3). In addition, considering the total of the questions, an average of 5.78 (0.70) points was verified.

Table 3. Descriptive analysis of translated SCI (n = 540)

Question	Content	Minimum	Maximum	Mean (SD)
SCI-1	Performance of physical skills	1	7	6.44 (0.94)
SCI-2	Focus during the competition	1	7	5.63 (1.12)
SCI-3	Recovery after performance error	1	7	5.70 (1.15)
SCI-4	Sufficient physical training	1	7	5.93 (1.21)
SCI-5	Critical decision making	1	7	5.38 (1.40)
SCI-6	Focus after an error	1	7	5.70 (1.23)
SCI-7	Physical fitness to compete	1	7	5.95 (1.12)
SCI-8	Use of strategy	1	7	5.93 (1.05)
SCI-9	Overcoming negative thoughts	1	7	5.74 (1.17)
SCI-10	Specific sports skills	1	7	6.03 (1.05)
SCI-11	Focus maintenance	1	7	5.87 (1.12)
SCI-12	Overcoming problems and setbacks	1	7	5.66 (1.14)
SCI-13	Physical preparation to compete	1	7	5.83 (1.22)
SCI-14	Control of nervousness	1	7	5.27 (1.35)
SCI-Total		37	98	81.07(9.74)

Internal Consistency

Regarding the internal consistency, Cronbach's alpha of 0.881 was verified considering all the questions of the translated SCI. Considering the different dimensions Cronbach's alpha was found to be 0.78 for the dimension of "physical skills and training", 0.66 for the "cognitive efficiency" dimension and 0.78 for the "resilience" dimension. In addition, McDonald's omega coefficient was calculated for each dimension. A value of $\omega = 0.69$ was found for the Cognitive efficiency factor, $\omega = 0.71$ for the resilience factor and $\omega = 0.79$ for the Physical skills and training factor.

Construct validity

For construct validity, the sample of 540 athletes was divided into two subgroups with approximately 50% of the total, which resulted in one group for exploratory factor analysis (n = 260) and another group for confirmatory factor analysis (n = 280). As shown in Table 4, the EFA was distributed in two factors, which explain 36.84% (Factor 1) and 14.12% (Factor 2) of the variance. In the present analysis, factor 1 contemplated the same issues as the original SCI "Physical skills and training" dimension, while factor 2 added the questions concerning the original dimensions of "Cognitive Efficiency" and "Resilience". Regarding the descriptive values of the factors, a score of 6.04 (0.81) points for the "Physical skills and training" factor and

5.65 (0.80) points for the factor that grouped the factors "Cognitive efficiency" and "Resilience." Regarding the internal consistency of the two factors, a value of $\omega = 0.84$ was found for the cognitive efficiency and resilience factor and $\omega = 0.79$ for the physical skills and training factor.

Table 4. Factor analysis of translated SCI (n = 260)

Factors	Question	p*	Explication (%)
Cognitive efficiency and resilience	SCI-2	0.617	36.84%
	SCI-3	0.665	
	SCI-5	0.493	
	SCI-6	0.772	
	SCI-8	0.371	
	SCI-9	0.742	
	SCI-11	0.608	
	SCI-12	0.499	
	SCI-14	0.643	
Physical skills and training	SCI-1	0.347	14.12%
	SCI-4	0.729	
	SCI-7	0.708	
	SCI-10	0.574	
	SCI-13	0.825	

*factorial load.

From the results of the EFA, we conducted the CFA of the SCI translated from two factors in the other sample analysis group (n = 280), with the criteria of the global adjustment indicators of the model being met, in which RMSEA = 0.078; CFI = 0.90; TLI = 0.86; SRMR = 0.062. In addition, we conducted the CFA in the translated CSI composed of the three original dimensions, in which the values of RMSEA = 0.079; CFI = 0.90; TL = 0.87; SRMR = 0.062 also presented adequate global fit adjustment indicators. Finally, KMO (Kaiser-Meyer-Olkin) test indices of 0.870 were verified for the two analyzes indicating suitability of the sample to the model. The results of the CFA were shown in Table 5 and Figure 1. According to the EFA results, the two-factor model was considered the most suitable for SCI-BR.

Table 5. Adjustment statistics of the translated SCI model composed of two and three factors (n = 280)

Model	X ²	CFI	TLI	RMSEA	SRMR	df
SCI (two factors)	204.902	0.90	0.88	0.078	0.062	74
SCI (three factors)	202.332	0.90	0.87	0.079	0.062	76

CFI = Comparative fit index; TLI = Tucker-Lewis index; RMSEA: Root Mean Square Error of Approximation; SRMR: Standardized Root Mean Square Residual; KMO: Kaiser-Meyer-Olkin.

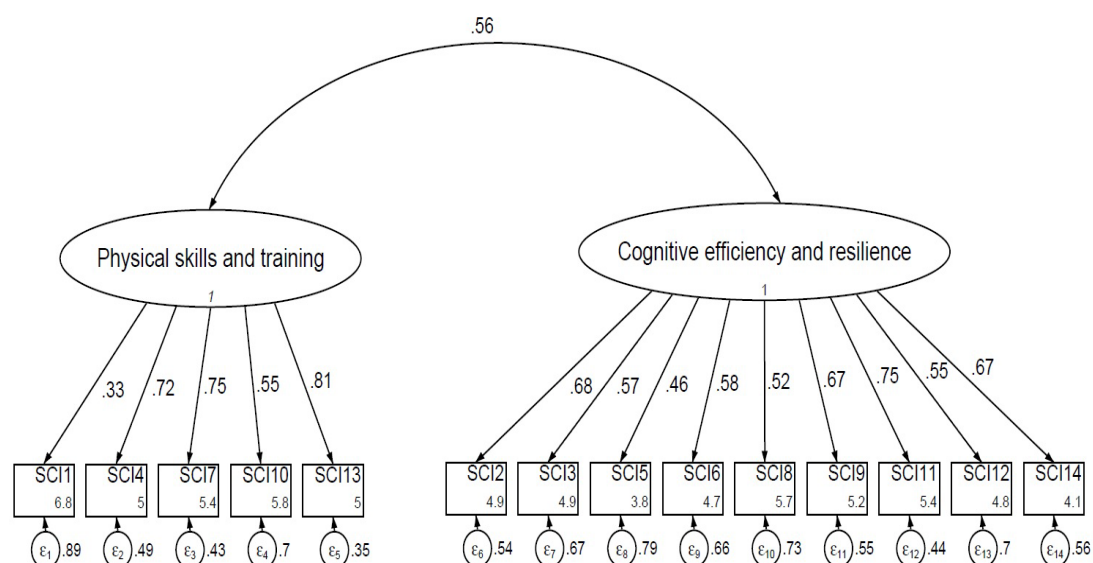


Figure 1. Graphical representation of the CFA of SCI composed of two factors. Note: Factors are represented by the circle and the indicators (questions) are represented by rectangles. The arrows starting from the factors for the indicators represent the factorial loads. Simple variances are represented by the circle below the indicators. The arrows linking the factors indicate the correlation between them

Discussion

The SCI translated into Portuguese presented constructive validity indexes and satisfactory internal consistency, proving to be a scientifically valid instrument for the evaluation of sport confidence in Brazilian adolescent athletes. Thus, it is considered that the SCI-BR can be applied in teams of initiation, training and sports specialization, in order to probe the general and specific levels of confidence of the Brazilian young athletes and to signal to the technical team an interventional direction in the questions and/or factors with worse indexes.

Regarding the validity of the construct, the Portuguese version of the instrument is consonant with the original version (Vealey & Knight, 2003). Only with regard to the composition of the clustering factors of the dimensions were observed dissonances among the instruments insofar as the distribution of the indicators of the original factors of "Cognitive Efficiency" and "Resilience" were grouped into a single factor in the translated version. Fogarty et al. (2016), when analyzing the psychometric properties of SCI, corroborated with this result when they identified high inter-correlations between the factors and indicators of "Cognitive Efficiency" and "Resilience", indicating overlap between them. In addition, in the study of Frischknecht, Pesca and Cruz (2016), the authors verified differences in factorial composition of SCI for Brazilian soccer players and gymnasts from 12 to 22 years old, in which three factors were identified for soccer players and four factors for gymnasts.

In order to explain the differences in factor composition found in the present study, it is possible to reflect on possible cultural issues between the samples from the Brazilian study and from the North American studies of SCI. American athletes are recognized worldwide for being highly tactically and technically applied, and growing in environments where young athletes

are taught, early on, to be resilient in the face of difficult situations (Shinke & Jerome, 2002). Thus, resilience in North American culture would be a skill worked from childhood and improved on the sport. Galli and Gonzalez (2015) argue that football coaches create crowd noises to simulate adverse situations during training, especially when communication failures seem to plague the team. In addition, Schinke and Jerome (2002) verified the effectiveness of resilience training for international athletes based on variables of optimism, indicating performance improvement in challenging scenarios through the development of directed cognitive skills.

In the training scenario of athletes in Brazil, in turn, it seems that these two factors coexist, not allowing a conceptual and procedural differentiation by athletes about cognitive (strategy and tactics) and resilience (behavior towards adverse situations). Thus, in Brazil, resilience is not a culturally valued skill developed from childhood and, in the case of athletes, it needs to be learned, to a great extent, by the way in the sports environment, requiring great cognitive and adaptive demand. Despite this, the multidimensional understanding of the model of confidence in sport was confirmed (Vealey & Knight, 2003; Vealey & Chase, 2008), as well as in a study by Machida et al. (2016), in which the authors also verified the presence of more than one factor in the SCI applied in 512 young north american athletes.

Regarding the confirmatory analysis of the translated SCI, it was verified that the global indicators of fit to the model in the instrument of two and three factors were considered adequate, and similar results were observed in the SCI of two factors compared to the three-factor SCI results. These indices are in line with the results of Vealey and Knight (2003) and Machida et al. (2016). However, in the study by Fogarty et al. (2016), the authors observed that although the fit values of the data for the CFI and TLI were considered acceptable in the three-factor SCI, the RMSEA exceeded the cut-off criterion commonly used in the literature (RMSEA = 0.100, CFI = 0.98, TLI = 0.66) (Hu & Bentler, 1999). Considerando os resultados dos estudos acima, com os resultados do presente estudo, assume-se que diferenças culturais podem interferir na interpretação das questões de um mesmo instrumento redimensionando-o para a composição de diferentes fatores. Neste sentido, considera-se que a aplicação do SCI-BR de dois fatores para atletas adolescentes brasileiros não afeta o processo de avaliação da confiança no esporte comparada à aplicação do SCI de três fatores. Considering the results of the studies above, with the results of the present study, it is assumed that cultural differences can interfere in the interpretation of the questions of the same instrument, resizing it to the composition of different factors. In this sense, it is considered that the application of the two-factor SCI-BR for Brazilian adolescent athletes does not affect the process of assessing sport confidence compared to the application of the three-factor SCI.

As for the descriptive analysis of the translated instrument, the overall mean was 5.79 (0.70) points, and this index was similar to that found by Vealey and Knight (2003) of 5.62 (0.90) points and higher than that observed by Fogarty et al. (2016) of 5.31 (0.72) points. When considering factor means, Vealey and Knight (2003) found an mean of 5.80 (0.99) points for the "Physical skills and Training" factor, 5.69 (0.90) points for the

"Cognitive Efficiency" factor and 5.54 (0.97) points for the "Resilience" factor, whereas Fogarty et al. (2016) found a mean of 5.40 (0.86) points for the "Physical skills and Training" factor, 5.31 (0.83) points for the "Cognitive Efficiency" factor and 5.21 (0, 85) points for the "Resilience" factor. In the present study, scores were 6.04 (0.81) points for the "Physical skills and Training" factor and 5.65 (0.80) points for the factor that grouped the original factors of "Cognitive Efficiency and Resilience". These results demonstrate that both athletes in the cited studies and Brazilian athletes are more confident in the indicators related to their skills and physical fitness to compete (in this study they are observed by the highest scores in questions 1, 4 and 7), to the detriment of the indicators related to the focus during the competition (question 2), critical decision making (question 5) and control of nervousness (question 14).

It is assumed that in situations of pressure in the competitive environment, although athletes have greater confidence in physical preparation to the detriment of psychological issues, lower confidence values related to cognitive efficiency and resilience can generate negative repercussions regarding the control of emotions and cognitive processing, causing the athlete to perform below the expected performance (Vieira et al., 2011). In this sense, the less certainty in the degree of confidence in successfully controlling nervousness may be related to the higher levels of anxiety of the adolescent athletes. In a study about pre-competitive anxiety and performance with young female rhythmic gymnastics athletes, for example, the authors verified lower rates of cognitive anxiety in high performance athletes and finalists compared to low performance athletes and non-finalists respectively (Tsopani et al., 2011).

Regarding the use of this instrument in Brazil, Frischknecht, Pesca and Cruz (2016), made the translation into Portuguese language and validation for Brazilian soccer players and gymnasts from 12 to 22 years. However, the authors suggested that the semantic quality of the instrument needed further refinement and reported that gymnasts had difficulty in understanding and familiarizing some translated terms, such as the question of using "tactical strategies". However, regarding the results that were observed in the present study, it is considered that the translation, cultural adaptation and validation of SCI for Brazilian adolescent athletes was able to fill the indicated gap, seeing that high internal consistency, reproducibility and content validity coefficients were related to language clarity, practical relevance and comprehension of translated terms.

Therefore, it is suggested that the instrument translated and adapted culturally to the Portuguese language, can be included in protocols of psychological evaluation by technical-sports teams, in order to detect the self-confidence indexes of the athletes before the competition. If we observe low scores or fluctuations in scores in the various periods of training and competition, intervention measures with the goal to increase the levels of self-confidence of athletes must be encouraged. Whether these are global, or according to specific needs (for example, directed to one of the factors of the SCI). In addition, Fogarty et al. (2016), indicated the application of SCI to sports psychologists interested in the effects of interventions on confidence, mainly because the SCI content is based on current competitive situations. In this sense, mental training sessions (Mamassis & Doganis, 2004) with the

use of self-talk techniques (Hatzigeorgiadis et al., 2009), techniques of motivational imagery (Callow & Hardy, 2001; Mills et al., 2001; Vadocz et al., 1997; Munroe-Chandler; Hall & Fishburne, 2008) and the use of cognitive behavioral intervention (Hays et al., 2010), have been shown to be efficient for increasing the self-confidence of athletes.

It is highlighted as strong points of the present study, the representative sample of Brazilian adolescent athletes, as well as the great variety of sports in which they practiced. These factors strengthen the results regarding the multidimensionality of the confidence construct in sports for this population and future studies are needed to test the stability of confidence levels at different points in the competitive season, and also to relate the global and partial score of the SCI factors with the sport performance of Brazilian adolescent athletes. The limitations of the present study are the cross-section design and the participants recruitment from one specific moment. In addition, the use of a sample from a single region of Brazil is pointed out as a limitation, with the need to verify the parameters for the rest of the population.

Conclusion

The sport confidence construct translated and adapted to the Brazilian Portuguese presented evidence of content validity, reproducibility, internal consistency, and construct validity. In addition, the SCI-BR retained the original instrument's characteristic of its multidimensionality, being explained physical skills and training (factor 1) and cognitive efficiency and resilience (factor 2) domains.

Therefore, it is suggested that SCI-BR must be used to survey the degree of confidence in the sport of Brazilian athletes, regarding their skills and training, cognitive efficiency and resilience, aimed at performance in sports. Although there are no SCI reference values for the athlete population, the verification of lower SCI-BR average scores compared to the SCI-BR averages scores of peers of the same age, sex and sport, may indicate low sport confidence. In this case, intervention procedures related to increased confidence must be considered, especially in periods prior to important competitions. In addition, it is suggested that the application of the SCI-BR be carried out periodically before competitions to check for possible fluctuations in the sport confidence level that may compromise the athletes' performance.

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