Psychometric properties of the of the university sport experiences scale – portuguese

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ABSTRACT

Over the last decades, qualitative methods have dominated Positive Development through sports research. Therefore, valid and reliable quantitative measurement tools are scarce. Additionally, most Positive Development research has focused on youth sport contexts. University sport has been considered a crucial period for a Positive Development approach, and researchers have created the University Sport Experience Survey, which assesses Positive Development in university sport. Although the psychometric properties of USES were confirmed, its validity may be confined to Canadian settings. This study aimed to investigate a cross-cultural adaptation of the University Sport Experiences Survey for a Portuguese-speaking population of university athletes. Our results suggest this confirmed model, containing Portuguese translated items, has strong factorial validity for assessing developmental outcomes of university-aged student-athletes in Brazilian university contexts. Current results support the external validity of University Sport Experiences Survey and offer evidence of the first validated Portuguese assessment tool for assessing Positive Development in university sport.

KEYWORDS: positive development; measurement; student-athletes; validity.

INTRODUCTION

Over the past decades, researchers have attempted to understand how sport can be used to create developmentally sound experiences for youth and adult participants (Holt et al., 2017). In many cases, sports participation is associated with optimal developmental experiences and outcomes such as learning leadership skills and transferring them to other life domains (Fraser-Thomas, Côté, & Deakin, 2005). Positive Development (PD) has been used as an overarching asset-based framework (Lerner Almerigi, Theokas, & Lerner, 2005) to enhance optimal development through sport. As a framework, PD acknowledges the need to intentionally teach sport participants personal and social skills that may be applied in and outside sport. Several researchers (e.g., Camiré, Forneris, Trudel, & Bernard, 2011; Weiss, Bolter, & Kipp, 2016) have used PD to develop structured sport-based programs conducive to PD outcomes such as emotional control, perseverance, and goal-setting in the past.

Although PD is a popular framework for understanding the experiences of sport participants (Holt et al., 2017), assessing PD has been a complicated endeavor from a quantitative perspective (MacDonald & McIsaac, 2016). One reason

for the measurement issues surrounding PD is that no consensus exists on which outcomes and experiences constitute PD (Geldhof et al., 2014; Weiss, 2016). Another factor that has negatively impacted assessment within PD research is the lack of validated tools (MacDonald & McIsaac, 2016). To increase the rigor of the quantitative measurement of PD, Holt, Deal, and Smyth (2016) suggested that researchers provide operational definitions of PD constructs and identify suitable assessment tools for analyzing the impact of PD-based programming.

In recent years, reliable and valid quantitative assessment tools for measuring PD have emerged within the youth sport context (Cronin & Allen, 2017; MacDonald, Côté, Eys, & Deakin, 2012). For instance, the Youth Experience Survey for Sport (YES-S) has 37 items that measure four dimensions of positive experiences (i.e., personal and social skills, initiative, goal setting, cognitive skills) and one dimension of negative experiences related to youth sport (MacDonald et al., 2012). Similarly, Cronin and Allen (2017) created the Skills Scale for Sports (LSSS) to assess the skills athletes learned in sport that will help them succeed in other areas of life. The LSSS contains 43 items, divided into eight subscales: teamwork, goal setting, social skills, problem-solving and decision making, emotional skills, leadership, time management, and interpersonal communication. Although the advent of these new assessment tools is promising, these quantitative assessment tools are limited to youth and adolescent populations. This is problematic since PD continues beyond adolescence and into emerging adulthood (Arnett, 2006; Rathwell & Young, 2016). As such, a need remains for similar PD based quantitative assessment tools designed for older populations of athletes (Rathwell & Young, 2016).

One population that is promising for evaluating PD through sport is university athletes. Rathwell and Young (2016) argued that university sport was a valuable context for PD-based programs (Rathwell, & Young, 2016) since university athletes have entered emerging adulthood and need to develop the requisite personal and social skills for successful integration in society (Arnett, 2006). Rathwell and Young's (2017, 2018a) series of studies on the PD processes within university sport led to the development and validation of a scale for assessing PD outcomes within the university sport context (Rathwell & Young, 2016). The scale is known as the University Sport Experiences Survey (USES — Rathwell & Young, 2016) and measures PD outcomes specific to initiative, basic skills, interpersonal relationships, teamwork and social skills, adult networks and social capital, stress, negative peer interactions, social exclusion, and inappropriate adult behaviors.

From a scale development perspective, Rathwell and Young (2016) found evidence for the factorial validity and reliability of the USES using data from two independent samples of Canadian university athletes. Evidence for the face validity of the USES scales was found in a qualitative study of Canadian university athletes, where athletes spoke in detail about PD outcomes found on the USES (Rathwell & Young, 2018a). Finally, Rathwell and Young (2018b) described initial evidence for the concurrent validity of the USES scales as well. They surveyed 605 Canadian university athletes about their perceptions of Full Range Leadership behaviours (i.e., transformational, transactional, and laissez-faire leadership) using the Multifactor Leadership Questionnaire (Avolio & Bass, 2004). They found that coaches' use of transformational leadership was positively associated with initiative, basic skills, and interpersonal relationships through university sport. Taken together, the advent of the USES broadens the possibilities for understanding PD processes to emerging adult populations. However, the current evidence for the validity of the USES is limited to the Canadian context, which creates complex challenges for researchers attempting to assess PD worldwide.

Considering that PD has become an extensively used framework worldwide (Gaion-Rigoni, Nascimento Junior, Belem, Vieira, & MacDonald, 2018; Santos, Camiré, & Campos, 2018), more research is needed to expand the catalogue of validated quantitative assessment tools to study PD processes across different cultures. A major barrier to the quantitative assessment of PD globally is that most measurement tools have only been validated within English-speaking countries. As such, measurement tools for non-English speaking populations are scarce (e.g., Gaion et al., 2018). For instance, in Portuguese speaking countries, where PD through sports research has proliferated throughout the last few years (Martins, Rosado, Ferreira, & Biscaia, 2015; Santos et al., 2018), it is difficult to compliment qualitative findings without access to valid and reliable quantitative assessment tools. There is a need to validate existing PD measurement tools to understand PD in these contexts reliably to study PD in non-English speaking countries. Thus, the purpose of this four-phase research program was to validate a cross-cultural adaptation of the USES using data from a Portuguese-speaking population of university athletes.

In Phase 1, the USES items were translated from English to Portuguese, and the content validity of the translated items was assessed by a group of PD sport psychology researchers and a sample of university athletes. In Phase 2, the factorial validity and reliability of the translated items were explored and confirmed with data

from two large independent samples of University athletes from Brazil. In Phase 3, the temporal stability of athletes' responses on the translated USES items was assessed across time. In Phase four, the concurrent validity of the translated USES was assessed by testing associations between the USES subscales and theoretically relevant constructs. Together, these four phases of research sought to address a notable gap in the literature by establishing a survey capable of PD in University sport in alternative non-English speaking contexts. This translated scale will be referred to as the University Sport Experience Scale — Portuguese (USES-P) for the remainder of this paper.

PHASE ONE — TRANSLATION AND CONTENT VALIDITY

The purpose of Phase One was to translate the USES (Rathwell & Young, 2016) to Portuguese without losing the original meaning of the items (see Table 1 for a summary of different USES subscales). Following the translation, a small pilot study on Brazilian university athletes was conducted to test USES-P item comprehension. The content validity of the USES-P was also assessed by a group of sport psychology researchers.

Translation

The first step in adapting the instrument was to perform a back-translation, which consisted of translating the original USES items (Rathwell & Young, 2016) from English to Portuguese and then translating the items back to English again (Vallerand, 1989). The back-translation was performed by four professional scientific text translators. The first step involved two of the translators independently translating the USES from English to Portuguese. Next, the two other translators, who had no previous exposure to the original version of the USES, independently back-translated the Portuguese items to English. All translators were instructed to consider the content of the version they received (original or Portuguese) and to preserve the same meaning of the items (Cassepp-Borges, Balbinotti, & Teodoro, 2010).

Following the back translation process, a committee was established to determine the final version of the USES-P. This committee comprised three experts on PD through sport who had a Ph.D. in sport sciences (one of whom was the creator of the original USES) and the most experienced translator from the back translation process. The committee was provided with all the four versions of the translations (i.e., two versions in English and two in Portuguese) and was asked to:

(a) compare the two back-translated English versions with the original USES to assess fidelity;

(b) compare the two translated Portuguese versions with the original USES to assess if the same meaning was preserved (Cassepp-Borges et al., 2010).

When minor wording issues were identified, the committee changed the language until a final Portuguese version was determined (Vallerand, 1989).

Table 1. Items and meanings of University Sport Experiences Survey subscales.

Subscales	Items	Meaning
Initiative	1–9	Extent to which student athletes see their self-navigation abilities improve as a result of their involvement in university sport.
Basic skills	10–13	Degree to which athletes believe their involvement in university sport has helped improve their creativity and ability to find information.
Interpersonal relationships	14–19	Extent to which participation in university sport has facilitated the acquisition of personal relationships with others who have different socio-economic and ethnic backgrounds.
Teamwork and social skills	20–27	Extent to which athletes perceive that sport involvement has improved their ability to work with others in relation to group dynamics.
Adult networks and social capital	28–30	Degree to which athletes feel they have developed off-campus social networks as a result of their sport participation.
Stress	31–34	Athletes' perceptions of mental and emotional strain related to their university sport experience or their student athlete roles.
Negative peer interactions	35–37	Athletes' perceptions regarding how their participation in university sport is related to immoral or risky behavior.
Social exclusion	38–40	Extent to which athletes perceive that sport involvement has led to their exclusion from others.
Inappropriate adult behavior	41–46	Players' perceptions of inappropriate or misplaced behaviors, interactions, or expectations from their sport leaders.

Pilot study

Following the back translation, a pilot study was conducted to test whether the USES-P was understood by Brazilian university athletes. Prior to collecting data, approval was received from the host university's research ethics and integrity office. The pilot test involved a sample of 20 university athletes (12 male and 8 female) aged 18 and 25 years. After providing consent, athletes were asked to answer the USES-P items and report any concerns regarding the clarity of language or relevance of the items to the university sport context (Marôco, 2010). All athletes answered the USES-P items and indicated no concerns about the clarity or relevance of the items.

Content validity

Following the pilot test, the content validity of the USES-P was tested using an expert group of sport psychology researchers, who were independent of the current study. More specifically, the USES-P was sent to three university professors who were external to this research project, who had expertise on PD through sport, were fluent in English, and were currently working in Brazilian universities. These university professors received the USES-P items in a random order (i.e., not organized by factor) and were asked to assess each item regarding clarity of language (i.e., Is this item written in an understandable way?) and theoretical importance (i.e., Does this item enabled an understanding about PD through university sport). The questions were answered on a 4-point Likert scale (1= not at all, 4= very much). The university professors were then provided with the operational definitions of the USES scales (i.e., initiative, basic skills, interpersonal relationships, teamwork and social skills, adult networks and social capital, stress, negative peer interactions, social exclusion, and inappropriate adult behavior) and asked to place each item within the scale they believe it belonged to (Hernández-Nieto, 2002).

Data analysis

Content validity coefficients (CVC) were calculated based on the university professors' Likert scale responses regarding clarity of language and theoretical importance separately. An overall CVC was calculated for USES-P on language clarity and theoretical relevance. Individual item level CVC scores were also assessed on these two dimensions. CVC scores of 0.80 were deemed acceptable (Hernández-Nieto, 2002). Additionally, a Kappa coefficient was calculated to assess the university professors' ability to match each item within their appropriate scale. A Kappa score > 0.60 was considered acceptable, and a Kappa score > 0.80 was considered excellent (Landis & Koch, 1977).

Results

The overall CVC and all item level CVC scores were acceptable on theoretical importance (CVC> 0.80). With regards to the clarity of language, the overall CVC score was 0.88. All item level CVC scores were above 0.80 except for four items (items 7= 0.76; 34= 0.69; 38= 0.76; and 45= 0.76). Despite having four items with CVC scores below 0.80, a decision was made to keep all items considering that the CVC scores were relatively close to 0.80 and that the athletes raised no concerns. With this said, the research team flagged these four items for consideration in future analyses. The Kappa coefficient representing agreement among experts regarding USES-P item classification was 0.83, indicating that the evaluators effectively placed USES-P items within their appropriate scales.

PHASE TWO — CONSTRUCT VALIDITY AND INTERNAL RELIABILITY

The purpose of Phase Two was to assess the construct validity of the USES-P by testing the fit and factor structure of the instrument with a larger sample of Brazilian university athletes.

Method

Recruitment

Prior to collecting data, approval was received from the host university's research ethics and integrity office. A consent form to the athletes competing in the participant in the Brazilian University Games. For participants to be included in this study, they must have satisfied the following criteria:

(a) be an athlete participating in the 2017 Brazilian University Games;
(b) provide consent;
(c) complete the USES-P with minimal missing data.

Data collection was conducted in the athletes' accommodations in the city where the Brazilian University Games took place in the second half of 2017.

Participants

In total, a sample of 1021 athletes completed the in-person survey. However, 60 athletes were missing the majority of data for the subscales of interest. As a result, these 60 athletes were excluded from the study. The final sample consisted of 961 university athletes (492 male and 469 female) from four regions of Brazil: Midwest (198); North (66); Northeast

(188); South (247), and Southeast (262). Athletes were between 17 and 39 years old (M_{age}= 21.00 years; SD= 2.89 years) and reported an average practice time of 10.28 hours (SD= 4.58) per week. Athletes were members of their current university team for an average of 2.80 years (SD= 2.02) and represented the following sports: athletics (104); badminton (20); basketball (154); 3x3 basketball (29); beach volleyball (21); chess (13); handball (125); indoor football (122); judo (65); swimming (97); table tennis (13); taekwondo (29); tennis (6); volleyball (161).

Of importance, this study was the first to our knowledge to test a Portuguese version of the USES with non-Canadian athletes. As such, it was important to split our data randomly into an exploratory and confirmatory sample. The reason for independent exploratory and confirmatory samples is that during the modification process (if required), it is possible to capitalize on unstable chance-based factors when determining the fit and factor structure of the model (Hair, Black, Babin, Anderson, & Tatham, 2014). With an independent sample, no such chance exists because the data from the confirmatory sample did not influence which items were trimmed or retained in the exploratory process. Therefore, we randomly split our data into two independent samples (sample one= 480 athletes; sample two= 481 athletes) to obtain an exploratory (i.e., sample one) and confirmatory sample (i.e., sample two).

Measures

For this study, we were interested in athletes' responses to the USES-P.

Analysis

Using the Mplus software program (Muthén & Muthén, 2012), Exploratory Structural Equation Modeling (ESEM) with a target rotation (oblique) was used to test the fit and factor structure of the USES-P. In recent years, the use of Confirmatory Factor Analysis (CFAs) for evaluating complex survey data has been criticized for being too restrictive, resulting in poor item-level factor structures, and producing multicollinearity amongst factors (Marsh, Morin, Parker, & Kaur, 2014). ESEM provides an alternative approach that also provides parameter estimates, goodness-of-fit statistics, and standard errors (Marsh et al., 2014). Further, ESEM overcomes many of the issues with CFA by allowing cross-loadings to be freely estimated, which is more consistent with social science data. We used a robust maximum likelihood estimator (MLR) for our ESEM analyses. MLR produces both standard errors and tests of model fit. Various indices were used to assess model fit: Comparative Fit Index (CFI), Tucker Lewis Index (TLI), Standardized Root Mean Square

Residual (SRMR), Root Mean Square Error of Approximation (RMSEA), and the normed chi-square (χ^2/df). Hair et al. (2014) suggest a good model fit if CFI≥ 0.90, TLI≥ 0.90, SRMR≤ 0.08, RMSEA≤ 0.05, and χ^2/df≤ 5.

For the confirmation sample (i.e., sample two), we elected to used both CFA and ESEM since we aimed to replicate the factor structure of the USES-P with an independent sample of university athletes' data. Marsh et al. (2014) recommended using both ESEM and CFA and comparing the results for confirmatory analyses. A target rotation (oblique) was used for the ESEM, and an MLR estimator was used for both ESEM and CFA analyses. The aforementioned fit indices were used for both CFA and ESEM, with cutoff values remaining the same. Good model fit was assumed if CFI≥ 0.90, TLI≥ 0.90, SRMR≤ 0.08, RMSEA≤ 0.05, and χ^2/df≤ 5 (Hair et al., 2014).

As a final step, exploratory ESEM with a target rotation (oblique) was used to conduct measurement invariance tests in order to assess the homogeneity across our two samples (1= exploratory sample; 2= confirmatory sample). More specifically, invariance tests were used to verify if the latent variables and items measured in the USES-P were the same across the two samples of athletes. Measurement invariance was tested using a hierarchically ordered set of models (i.e., configural, metric, scalar) that increased in restrictiveness over each successive step (Wang & Wang, 2019). For configural invariance, equivalence was assumed if model fit criteria were satisfied. To assess metric and scalar invariance χ^2 differences, tests and changes in CFI were used. Specifically, χ^2 and CFI scores were compared at each level (i.e., configural vs. metric, metric vs. scalar), and homogeneity was assumed if the χ^2 difference test was non-significant and change in CFI< 0.01 (Byrne, 2016).

Results

Only 0.93% of the data were missing for the final sample. When less than 5% of data are missing, the influences of missing data are negligible (Tabachnick & Fidell, 2013). Missing data were treated with multiple imputations using an expectation-maximization method (Tabachnick & Fidell, 2013).

Exploratory sample

Using data from sample one, we began by testing the hypothesis that that responses to the 46 items would a) be explained by 9 correlated factors, and b) each item would have a primary factor loading of 0.32 or greater on its intended factors, and a loading of less than 0.32 on unintended factors. A factor loading of 0.32 was chosen as a cutoff value because this represents 10% or greater variance explained by the factor

(Tabachnick & Fidell, 2013). In general, ESEM summary statistics showed good model fit: CFI= 0.908, TLI= 0.855, SRMR= 0.029, RMSEA= 0.047 (90%CI= 0.043–0.051), and χ^2/df= 2.060. However, items 36 and 37 failed to load above 0.32 on the Negative peer interactions factor, item 10 had a problematic cross-loading (0.454) on initiative (an unintended factor), and item 20 had a problematic cross-loading (0.516) on Interpersonal Relationships (an unintended factor). These results suggest that modifications were required to the USES-P.

The first step in our modification process involved removing items that cross-loaded above 0.32 on unintended factors, starting with the items with the highest cross-loadings. Items were removed one at a time, and the model was retested after each removal. The purpose of removing items with high cross-loadings on unintended factors was to safeguard Rathwell and Young's (2016) hypothesized factor structure while improving the interpretability of the factor structures and model fit. In the final phase of data trimming, we removed any items that loaded below 0.32 on their intended factors. The iterative process of testing and removing items for violating loading criteria resulted in the loss of seven items (items 1, 2, 10, 20, 35, 36, 37) and one factor (Negative peer interaction). Negative peer interactions were removed because there were less than three items that loaded, which severely inhibits the interpretability of the factor. The resulting model was an eight-factor 39 item solution that showed good fit in general: CFI= 0.930, TLI= 0.886, SRMR= 0.027, RMSEA= 0.044 (90%CI= 0.039–0.048), and χ^2/df= 1.915. All factor loadings were significant, and all loadings were above .32 (range= 0.59–0.86) on their intended factor. No items loaded above .32 on unintended factors. All construct reliability (CR) scores were above 0.7, except for Basic Skills (CR= 0.69). CR scores above 0.7 indicate strong internal consistency reliability, while CR scores between 0.6 and 0.7 indicate adequate internal consistency reliability (Hair et al., 2014).

Confirmatory sample

Using data from sample two, we tested the final factor structure found with data from sample one using both ESEM and CFA. For ESEM, we hypothesized the 39 items would a) be explained by 8 correlated factors, and b) each item would have a primary factor loading of 0.32 or greater on intended factors and a loading of less than 0.32 on unintended factors. In general, ESEM summary statistics showed good model: CFI= 0.915, TLI= 0.862, SRMR= 0.027, RMSEA= 0.049 (90%CI= 0.045–0.054), and χ^2/df= 2.117. All factor loadings were significant and above 0.32 (range= 0.358–1.008).

Each factor had a CR score above 0.7, except for Basic Skills (CR= 0.66), indicating strong internal consistency reliability in general. See Table 2 for the ESEM factor structure and loadings for group two.

Correlations between subscales ranged from 0.01 to 0.57. All significant correlations between the positive subscales were positive. All significant correlations between the negative experience subscales were also positive (i.e., move in the same direction), and all significant correlations between the positive and negative subscales were in the inverse direction, as would be expected.

As another means of confirming the factor structure of the USES-P, we conducted a CFA using the data from sample two. CFAs are more restrictive than ESEM and test the hypothesis that a specific number of factors are explained by a specific number of indicators. In CFA analyses, each item is only allowed to load onto one factor, and all non-intended item loadings are constrained to zero. For our CFA, we hypothesized that 8 correlated factors would explain the 39 items. In general, summary statistics showed good model: CFI= 0.904, TLI= 0.895, SRMR= 0.048, RMSEA= 0.043 (90%CI= 0.040–0.047), and χ^2/df= 1.896. Factor loading was strong and ranged from 0.500 to 0.942. Correlations between subscales ranged from 0.09 to 0.68. All significant correlations between the positive subscales were positive. All significant correlations between the negative experience subscales were also positive (i.e., move in the same direction), and all significant correlations between the positive and negative subscales were in the inverse direction.

Invariance testing

Factorial equivalence for the USES-P was assessed using our exploratory and confirmatory samples. Results showed that the USES-P was invariant across our two samples of athletes. See Table 3 for invariance testing results.

PHASE THREE — TEMPORAL STABILITY

The purpose of Phase Three was to assess the stability of responses on the USES-P across time.

Method

Participants and data collection

24 athletes from Brazil completed the questionnaire at two different time points, with an interval of seven days between completion to investigate the temporal stability

Table 2. University Sport Experience Scale — Portuguese factor loadings using Exploratory Structural Equation Modeling (i.e., sample 2).

Items	IN	BS	IR	TS	AN	ST	SE	IB
1	**0.575**	0.014	0.077	0.050	-0.013	-0.049	0.015	0.002
2	**0.664**	0.090	-0.082	0.023	0.063	-0.027	0.002	0.012
3	**0.717**	0.099	0.011	-0.122	0.056	-0.024	-0.056	0.020
4	**0.633**	0.024	0.079	0.069	-0.059	-0.046	-0.028	-0.029
5	**0.717**	-0.019	-0.021	-0.003	0.007	-0.058	0.024	-0.001
6	**0.834**	-0.041	-0.002	-0.028	-0.047	0.105	-0.011	-0.053
7	**0.608**	-0.031	-0.043	0.184	0.029	-0.002	0.023	0.012
8	0.013	**0.538**	0.082	0.035	-0.026	-0.032	0.115	-0.055
9	0.053	**0.778**	0.000	0.103	-0.029	0.053	-0.059	0.031
10	0.074	**0.541**	0.049	0.002	0.113	0.009	-0.014	-0.045
11	0.010	0.163	**0.483**	0.092	0.025	-0.004	0.007	-0.010
12	0.051	-0.092	**0.598**	0.115	0.019	-0.046	0.057	-0.111
13	-0.051	0.028	**0.393**	0.131	0.046	0.062	0.039	-0.087
14	-0.063	0.060	**0.578**	-0.020	0.068	-0.015	0.049	-0.017
15	0.079	-0.036	**0.731**	0.019	0.018	0.027	-0.042	0.020
16	-0.028	0.051	**0.749**	-0.101	-0.019	-0.050	-0.062	0.059
17	0.138	0.065	0.178	**0.387**	0.027	-0.058	-0.080	0.053
18	0.207	0.013	0.200	**0.358**	0.030	-0.020	-0.035	0.028
19	-0.078	0.070	0.008	**0.689**	0.033	-0.001	-0.045	0.005
20	0.075	-0.099	-0.069	**0.738**	0.033	0.013	0.048	-0.039
21	-0.083	0.021	-0.105	**0.892**	0.002	-0.091	0.032	0.010
22	0.000	0.017	0.058	**0.715**	-0.080	0.084	-0.023	-0.001
23	0.074	0.151	0.071	**0.394**	0.078	0.059	-0.056	0.009
24	-0.113	-0.018	0.150	0.116	**0.515**	0.019	-0.123	0.012
25	0.003	-0.010	-0.009	-0.040	**0.979**	-0.020	0.023	0.003
26	0.080	0.020	-0.030	0.005	**0.737**	0.045	0.072	-0.008
27	-0.022	-0.060	-0.029	-0.037	0.109	**0.677**	-0.063	0.041
28	-0.037	0.084	-0.065	0.045	0.029	**0.728**	-0.049	-0.018
29	-0.012	0.008	0.028	-0.041	-0.086	**0.668**	0.096	-0.027
30	0.031	0.006	0.033	0.011	-0.021	**0.640**	0.092	0.021
31	-0.060	0.063	-0.020	-0.093	0.030	0.069	**0.583**	0.054
32	0.022	0.007	-0.021	0.024	0.004	-0.041	**1.00**	-0.025
33	-0.008	-0.074	0.119	-0.026	-0.037	0.150	**0.371**	0.266
34	-0.030	-0.156	0.089	0.028	-0.011	0.068	0.136	**0.561**
35	-0.131	0.054	0.056	0.038	-0.045	-0.017	0.055	**0.659**
36	-0.031	0.049	-0.015	-0.027	0.050	-0.046	-0.001	**0.890**
37	0.034	-0.025	0.087	0.046	0.015	0.001	-0.014	**0.891**
38	0.073	0.058	0.007	0.013	-0.063	0.059	-0.047	**0.732**
39	0.031	0.064	-0.064	-0.054	0.031	-0.013	0.045	**0.815**

The item order corresponds with the items found in Appendix A. IN: initiative; BS: basic skills; IR: interpersonal relationships; TS: teamwork and social skills; AN: adult networks and social capital; ST: stress; NP: negative peer interactions; SE: social exclusion; IB: inappropriate adult behavior.

Table 3. Results of USES-P Measurement and Structural Invariance Tests for the Exploratory and Confirmatory sample

Invariance type	Overall fit indices						Model comparison	Change of fit indices				
	SBx2	df	CFI	TFI	SRMR	RMSEA		ΔSBx2	ΔCFI	ΔTFI	ΔSRMR	ΔRMSEA
1. Configural	1863.026**	914	0.923	0.874	0.027	0.046	2 against 1	209.704	0.003	0.031	0.011	-0.006
2. Metric	2072.730**	1162	0.926	0.905	0.038	0.040	3 against 1	245.744	0.002	0.033	0.012	-0.006
3. Scalar	2108.800**	1193	0.925	0.907	0.039	0.040	3 against 2	36.07	-0.001	0.002	0.001	0.000

USES-P = University Sport Experience Scale – Portuguese; SBχ^2 = satorra-bentler chi-square; df = degrees of freedom; CFI = comparative fit index; TLI = Tucker-Lewis index; SRMR = standardized root mean squared residual; RMSEA = root mean square error of approximation.*$p \le 0.05$.**$p \le 0.01$.

of the USES-P (Marôco, 2010). This sample was selected through a non-probabilistic sampling technique.

Instrument and procedures

The 8-factor USES-P with 39 items determined in Phase Two was used. Local sports organizations were contacted to obtain approval for data collection with athletes involved in their programs. Following consent, athletes were sent on the online link and asked to complete the USES-P.

Data analysis

Data were analyzed using SPSS version 22.0. Temporal stability was assessed through the intraclass correlation coefficient (ICC> 0.70), verifying the test-retest reliability of the instrument (Nunnally & Bernstein, 1994).

Results

The ICC assessed the test-retest reliability (temporal stability) of the scale. It was found that all USES-P dimensions showed ICCs higher than 0.70 (Initiative= 0.90; Basic skills= 0.84; Teamwork and Social Skills= 0.78; Adult Networks and Social Capital= 0.71; Stress= 0.90; Social Exclusion= 0.81; Inappropriate Adult Behavior= 0.90), with the exception of Interpersonal Relationships (ICC= 0.64).

PHASE FOUR — CONCURRENT VALIDITY

The purpose of Phase four was to test whether USES-P outcomes were associated with theoretically relevant constructs in a coherent manner. Within the sports literature, quality relationships between athletes and coaches have been described as paramount for PD outcomes to occur through sport (Turnnidge Evans, Vierimaa, Allan, & Côté, 2018). Moreover, recent research on adolescent coaches found that when coaches perceived having a high-quality relationship with their athletes that were close committed and complimentary, they also perceived greater development on PD outcomes such as teamwork, goal setting, social skills,

problem solving, emotional skills, leadership, time management and communication (Camiré, Rathwell, Turgeon, & Kendellen, 2019). In Phase four, we hypothesized that high quality coach athlete relationships would be positively associated with the positive USES-P outcomes (i.e., initiative, basic skills, inter-personal relationships, teamwork and social skills, and adult networks and social capital) and negatively correlated with the negative USES-P outcomes (i.e., stress, social exclusion, and inappropriate adult behavior).

Method

Participants

961 university athletes were recruited from all regions of Brazil. The sample consisted of 492 male and 469 female athletes aged between 17 and 39 years old (M_{age} = 21.00 years; SD= 2.89 years), from four regions of Brazil: Midwest (198); North (66); Northeast (188); South (247) and Southeast (262). The athletes reported an average practice time of 10.28 hours (SD= 4.58) per week and were members of their current university team for an average of 2.80 years (SD= 2.02). Participants represented the following sports: athletics (104); badminton (20); basketball (154); 3x3 basketball (29); beach volleyball (21); chess (13); handball (125); indoor football (122); judo (65); swimming (97); table tennis (13); taekwondo (29); tennis (6); volleyball (161).

Measures

To assess university athletes' PD, the 39 items 8 correlated factor USES-P established in Phase two was used. ESEM with target rotation (oblique) was used to test the fit and factor structure of the USES-P. Summary statistics showed good model fit: CFI= 0.929, SRMR= 0.024, RMSEA= 0.043 (90%CI= 0.041– .046), and χ^2/df= 2.816. The descriptive for each USES-P scale were as followed: Initiative (M= 5.64, SD= 1.03, Skewness= -1.19, Kurtosis= 2.18), Basic Skills (M= 5.12, SD= 1.31, Skewness= -0.75, Kurtosis= 0.37), Interpersonal Relationships (M= 5.75, SD= 0.94, Skewness= -0.92, Kurtosis= 0.88), Teamwork and Social

Skills (M= 5.81, SD= 0.82, Skewness= -1.09, Kurtosis= 2.05), Adult Network and Social Capital (M= 4.94; SD= 1.36, Skewness= -0.64, Kurtosis= 0.23), Stress (M= 4.10; SD= 1.5 Skewness= -0.21, Kurtosis= 0.69), Social Exclusion (M= 2.67, SD= 1.58, Skewness= 0.76, Kurtosis= -0.30), and Inappropriate Adult Behavior (M= 2.56, SD= 1.54, Skewness= 0.94, Kurtosis= -0.22).

To assess the quality of the coach-athlete relationship, the Coach–Athlete Relationship Questionnaire (CART-Q)-Athlete Version validated for Brazil (Vieira et al., 2015). The instrument consists of 11 items divided into three subscales: closeness, commitment, and complementarity. The items are rated on a 7-point type Likert scale from 1 (strongly disagree) to 7 (strongly agree). ESEM summary statistics showed good model: CFI= 0.976, TLI= 0.948 SRMR= 0.020, RMSEA= 0.051 (90%CI= 0.040–0.063), and χ^2/df= 3.502. However, many items had problematic cross loadings on unintended factors. Our findings are consistent with previous research that found evidence of multi-collinearity found between the subscales in the past (r> 0.90; Jowett & Ntoumanis, 2004), thus, we tested a one-factor 11 item structure that showed adequate model fit: CFI= 0.910, TLI= 0.888 SRMR= 0.046, RMSEA= 0.075 (90%CI= 0.067–0.083), and χ^2/df= 6.376. The descriptive for the one scale CART-Q were as followed: CART-Q (M= 6.02, SD= 1.02, Skewness= -1.62, Kurtosis= 3.35).

Path model

ESEM with target rotation (oblique) was used to test the cross-sectional relationships between the coach-athlete relationship and USES-P outcomes. ESEM summary statistics showed good model: CFI= 0.919, TLI= 0.892 SRMR= 0.029, RMSEA= 0.038 (90%CI= 0.036–0.041), and χ^2/df= 2.424.

Results

The coach-athlete relationship had significant positive relationships with all positive USES-P outcomes scales and significant negative relationships with all of the USES-P negative experiences scales (all p's< 0.01). For more information, see Table 4.

Discussion

The purpose of this four-phase program was to create a version of the USES (Rathwell & Young, 2016) that could validly and reliably assess PD outcomes and negative experiences associated with university sport for Portuguese student athlete populations. Our findings related to the content, construct, concurrent validity, and temporal stability of the USES-P were promising. More specifically, we were able to:

Table 4. Parameter estimates (standardized beta weights) derived from Exploratory Structural Equation Modeling path model.

Path	β	Standard error	t value	p-value
CARTQ→ IN	0.32	0.04	7.68	< 0.01**
CARTQ→ BS	0.23	0.04	5.46	< 0.01**
CARTQ→ IR	0.20	0.04	4.73	< 0.01**
CARTQ→ TW	0.29	0.04	7.18	< 0.01**
CARTQ→ AN	0.13	0.04	3.12	< 0.01**
CARTQ→ S	-0.17	0.04	-4.27	< 0.01**
CARTQ→ SE	-0.24	0.04	-6.18	< 0.01**
CARTQ→ IB	-0.23	0.04	-5.66	< 0.01**

β: standardized beta weights; CARTQ: coach athlete relestionship; IN: initiative; BS: basic skills; IR: interpersonal relationships; TS: teamwork and social skills; AN: adult networks and social capital; ST: stress; SE: social exclusion; IB: inappropriate adult behavior. * ≤ 0.05; ** ≤ 0.01.

(a) translate the original USES (Rathwell & Young, 2016) items into Portuguese while maintaining the meaning of each item;

(b) determine and confirm a factor structure that was similar to the original USES using two independent samples of Brazilian university athletes;

(c) confirm the stability of our new Portuguese measure over time;

(d) find cross-sectional relationships with a theoretically consistent construct (i.e., the coach-athlete relationship).

The advent of the USES-P is timely given the recent interest in the assessment and measurement of PD through sport in Brazil (Gaion Rigoni, Nascimento Junior, Belem, Vieira, & MacDonald, 2018) and offers the only validated scale in Portuguese that specifically targets PD attributed university sport.

When assessing university athletes' personal and psychosocial development, the USES-P addresses several gaps in the literature identified by Rathwell & Young (2016). For instance, Rathwell & Young (2016) cautioned that the fit and factor structure of USES might only be valid for Canadian university athletes and that more research was needed to test the external validity of the USES in other collegiate systems where student-athlete roles may reflect different realities than in Canada. In our current investigation, we explored the psychometric properties of the USES-P with two large samples of Brazilian university athletes. In general, we were pleased to find strong psychometric properties (all indices met criteria for good fit except some TLI scores, which fell

just shy of cutoff scores) for the USES-P, which maintained 39 of the 46 original USES items, and eight of the nine original factors. Having a high degree of overlap between the English and Portuguese versions of the USES is important because it will allow researchers to make cross-cultural comparisons between different university sport systems (e.g., Canada vs. Brazil).

On this note, the current findings allow us to provide the first profile of Brazilian university athletes' responses on each of the USES-P. In general, it appears the Brazilian student-athletes perceive clear benefits from their participation in university sport. On average, athletes "agreed" that they improved their initiative, interpersonal relationships, and teamwork, and social skills. The athletes "somewhat agreed" that they developed basic skills, as well as adult networks and social capital. On average, they were "uncertain" whether they experienced stress because of their university sports involvement. Brazilian student-athletes "somewhat disagreed" that they experienced social exclusion and inappropriate adult behavior. Our current findings mirror Rathwell & Young's (2016) study on Canadian athletes, whereby the average Brazilian university athlete perceived high levels of PD with relatively low levels of negative experiences. Although the findings are optimistic, it is important to note that there were athletes who had quite negative experiences. Thus, we caution people from making the interpretation that all university sports programs promote positive outcomes and that each program is equally viable in their pursuit of personal and psychosocial development.

Although there was a high degree of overlap between the USES-P and the USES, we were disappointed to lose the "negative peer interactions" scale from the USES-P. Interestingly, when compared to Canadian athletes, who perceived the items "I often do things that are morally inappropriate", "I often consume alcohol", and "I frequently take drugs" as an independent construct, Brazilian athletes associated morally inappropriate behaviours with stress (i.e., the item had a problematic cross loading on the stress factor), and drug and alcohol consumption with social exclusion (i.e., these items had problematic cross loadings on the social exclusion factor). The current findings may highlight a potential cultural difference between Canada and Brazil as it relates to how drugs and alcohol consumption is understood through sport participation. Unfortunately, our data does not allow us to explore this potential cultural difference in more detail, but it does highlight a prospective area for future research.

Another gap in the literature that Rathwell & Young (2016) outlined was a need to evaluate the relationships between theoretically-grounded concepts and USES outcome measures. In the current study, we explored the association between the coach-athlete relationship and USES-P outcomes. Within the PD through sports literature, quality relationships have been posited as a required foundation for personal and psychosocial development to occur through sport (Turnnidge et al., 2018). When considering the context of Brazilian university sport, our data suggest that when an athlete perceives to have a close, committed, and complementary relationship with their coach, they will also perceive high levels of positive outcomes related to:

(a) self-regulatory capacities;
(b) abilities related to finding information;
(c) personal relationships formed with athletes of different socioeconomic and ethnic backgrounds, abilities related to working with others;
(d) abilities related to building networks with important adults off-campus.

The current results align with past studies on adolescent athletes that demonstrate positive relationships between the coach athlete relationship and PD outcomes through sport (Camiré et al. 2019) and set the precedence for future researchers to begin to explore the process of PD in university sport in Brazil. For instance, future research may begin to explore different mediators and moderators to help explain how and why the coach-athlete relationship and PD outcomes of the USES-P are linked.

CONCLUSIONS

The purpose of this study was to validate a cross-cultural adaptation of the USES using data from a Portuguese-speaking population of university athletes. Although we are confident in the utility of the USES-P for assessing PD outcomes related to initiative, basic skills, interpersonal relationships, teamwork and social skills, adult networks and social capital, stress, negative social exclusion, and inappropriate adult behavior, the USES-P should not be seen as an exhaustive tool for evaluating all developmental outcomes that result from university sport participation in Brazil. Due to the fact that the USES-P outcome measures were constrained by the prior USES (Rathwell & Young, 2016) themes, the USES-P may be missing PD outcomes that are unique to the Brazilian context. Thus, we put forth that future research looking to evaluate PD in the Brazilian context should examine what needs to be added to the USES-P using both qualitative and quantitative methods.

From a qualitative perspective, researchers may explore the perception of the various stakeholders within the Brazilian context to gain more insight on the breadth of PD outcomes

associated with university sport. Conversely, from a quantitative perspective, one might test whether factors from the Youth Experience Scale (YES 2.0; Hansen & Larson, 2005) that were lost when creating the USES (Rathwell and Young, 2016) might converge when tested in Brazilian university sport contexts. For instance, Rathwell and Young (2016) were upset that they failed to retain the identity subscale borrowed from the YES 2.0 (Hansen & Larsen, 2005). Due to the high degree of relevance to emerging adulthood (Arnett, 2006), they made a call for future research to establish a psychometrically sound identity subscale. In the current study, we did not test whether Portuguese translated YES 2.0 items would converge using data from our Brazilian university athletes. However, it is possible that these items may be interpreted in a more succinct way within this new context. Moving forward, we encourage researchers within Portuguese-speaking countries to further explore the USES-P and provide insights about how university sport may help athletes develop.

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Appendix 1. University Sport Experience Scale — Portuguese.

Instruções: O seguinte questionário avaliará a experiência proporcionada a você através da sua participação no esporte universitário. Com base em sua participação atual ou recente, por favor, classifique o nível ao qual você concorda ou discorda com as seguintes instruções de como eles se relacionam com a sua participação em seu programa de esporte universitário.						
1 Discordo plenamente	2 Discordo	3 Discordo em partes	4 Incerto	5 Concordo em partes	6 Concordo	7 Concordo plenamente

Como resultado do meu envolvimento no esporte universitário:

		1	2	3	4	5	6	7
1.	Estou mais capaz de colocar toda minha energia em uma atividade que é importante para mim							
2.	Estou mais empenhado							
3.	Estou mais capaz de focar minha atenção							
4.	Estou melhor em desenvolver planos para resolver um problema							
5.	Estou mais capaz de organizar meu tempo e não adiar coisas que precisar ser feitas							
6.	Estou melhor em estabelecer minhas prioridades							
7.	Estou melhor em praticar autodisciplina							
8.	Acredito que melhorei minhas habilidades de informática e de usar a internet							
9.	Acredito que melhorei minhas habilidades criativas							
10.	Acredito que minhas habilidades artísticas melhoraram							
11.	Tenho melhor entendimento sobre o que tenho em comum com pessoas de diferentes origens							
12.	Eu conheci melhor pessoas de diferentes grupos étnicos							
13.	Fiz mais amigos que vem de diferentes classes sociais (mais ricos ou mais pobres)							
14.	Eu falo sobre moral e valores com os outros com mais frequência							
15.	Estou mais ciente dos diferentes obstáculos que outras pessoas enfrentam							
16.	Eu valorizo mais os contextos sociais das outras pessoas							
17.	Estou melhor em dar feedback							
18.	Estou melhor em receber feedback							
19.	Sei mais sobre os desafios de ser um líder							
20.	Estou mais confiante que posso enfrentar desafios quando os outros estão contando comigo							
21.	Estou melhor em ser responsável por um grupo de colegas							
22.	Estou melhor em apoiar os outros							
23.	Estou mais capaz de tomar uma posição quando não concordo com algo							
24.	Acredito que conheci mais pessoas na comunidade fora do campus							
25.	Me sinto mais apoiado pela comunidade fora do campus							
26.	Me sinto mais parte da minha comunidade fora do campus							
27.	Estou frequentemente impossibilitado de estudar o suficiente para os testes							
28.	Estou impossibilitado de fazer coisas em família com mais frequência							
29.	Estou frequentemente estressado							
30.	Frequentemente me sinto com trabalho demais							
31.	Frequentemente sinto que não pertenço aos grupos que estou envolvido							
32.	Frequentemente me sinto deixado de lado							
33.	Frequentemente estou exposto a "panelinhas"							
34.	Estou frequentemente exposto a líderes que são controladores e manipuladores							
35.	Estou frequentemente exposto a líderes que fazem comentários e piadas sexuais inadequados							
36.	Estou frequentemente exposto a líderes que menosprezam minhas ideias							
37.	Estou frequentemente exposto a líderes que me culpam por coisas que vão além o meu controle							
38.	Estou frequentemente exposto a líderes que tem seus atletas favoritos							
39.	Estou frequentemente exposto a líderes que me menosprezam							

Iniciativa: 1 a 7; habilidades básicas: 8 a 10; relações interpessoais: 11 a 16; habilidades sociais e trabalho em equipe: 17 a 23; rede de adultos e capital social: 24 a 26; estresse: 27 a 30; exclusão social: 31 a 33; comportamento adulto inapropriado: 34 a 39.