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Cross-Cultural Adaptation and Psychometric Properties of the Portuguese Version of the Life Skills Scale for Sport

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Cross-Cultural Adaptation and Psychometric Properties of the Portuguese Version of the Life Skills Scale for Sport

This research adapted the Life Skills Scale for Sport (LSSS) into Portuguese and provided evidence for its construct validity. Study 1 included four translators and five academics who developed a Portuguese version of the LSSS (P-LSSS). During this study, evidence for the content and substantive aspects of construct validity was provided using an expert panel and 25 sports participants. Study 2 included 413 participants that completed the P-LSSS. Within this study, evidence for the structural aspect of construct validity was provided via factor analyses. Study 3 included 134 participants who completed the P-LSSS and a measure of motivation. This study provided evidence for the external aspect of construct validity, with results showing more self-determined motivation had positive relationships with participant's life skills development. Overall, our findings provided evidence for the construct validity of P-LSSS scores. Researchers and practitioners can use the P-LSSS to assess life skills development within sports participants.

Keywords: positive youth development; life skills; validity; reliability

Introduction

The past fifteen years has seen an increasing number of studies investigating the potential of sport to bring about positive developments in young people. This point is highlighted by recent review articles and book publications (e.g., Holt et al., 2017; Holt, 2016), which have focused specifically on the topic of positive youth development through sport. At its core, positive youth development is an umbrella term which refers to strength-based and asset building approaches to developmental research which view young people as 'resources to be developed' as opposed to 'problems to be solved' (Holt, Sehn, Spence, Newton, & Ball, 2012). Key outcomes of the positive youth development approach include young people's psychological well-being and the life skills they develop through sport (Jones, Dunn, Holt, Sullivan, & Bloom, 2011; King et al., 2005).

Life skills in particular have received a great deal of research attention within the positive youth development through sports literature. Life skills have been defined as the skills that are required to deal with the demands and challenges of everyday life (Hodge & Danish, 1999). Other researchers suggest that key aspects of 'life skills' are that they can be learned, developed, refined (Danish, Forneris, & Wallace, 2005) and transferred/utilized in other life domains such as school, social relationships and employment (Kendellen, Camiré, Bean, Forneris, & Thompson, 2017). Several review articles have highlighted that young people develop a range of different life skills through sport (e.g., Johnston, Harwood, & Minnitti, 2013; Pierce, Gould, & Camiré, 2017). Examples of life skills which young people are purported to develop through sport include teamwork, goal setting, interpersonal communication, and leadership skills (Cronin & Allen, 2017).

Recently, Cronin and Allen (2017) developed the Life Skills Scale for Sport (LSSS), which can be used by researchers to assess young people's life skills development through sport. This scale evaluates the eight most commonly cited life skills which young people are purported to develop through sport: teamwork, goal setting, social skills, problem solving and decision making, emotional skills, leadership, time management, and interpersonal communication skills (Johnston et al., 2013). Using this scale, researchers can assess the extent to which young people are developing certain life skills through sport and begin to investigate the theories and mechanisms that may help to explain the processes by which young people develop their life skills through sport. For example, self-determination theory (Ryan & Deci, 2017) is one pertinent theory that has been proposed for investigating life skills development within youth sport (Hodge, Danish, Forneris, & Miles, 2016). Additionally, applied practitioners can use the scale to assess if sport-based life skills programs are successfully developing certain life skills in participants. Within English speaking populations, several research studies have provided evidence for the validity (i.e., content and factorial validity) and reliability (i.e., internal consistency reliability and test-retest reliability) of scores obtained from the LSSS across numerous data collections (Cronin & Allen, 2017, 2018; Mossman & Cronin, 2018).

However, because the LSSS is only available in English, the reach of the LSSS does not currently extend to non-English speaking populations. This is a common issue with the life skills development through sport literature, which is dominated by research within English speaking countries such as Canada and the United States (Santos, Camiré, & Campos, 2016). To address this issue, instruments such as the LSSS need to be adapted and tested psychometrically in several widely spoken languages. One such language is Portuguese, which is estimated to be the sixth most spoken language

worldwide, with over 200 million speakers in countries such as Portugal, Brazil, Mozambique and Angola (Parkinson, 2017).

Interestingly, within Portuguese speaking countries, some recent studies have begun to investigate the area of positive youth development through sport. For example, Santos and colleagues (Santos et al., 2016; Santos et al., 2017a, Santos et al., 2017b) have conducted a series of qualitative studies investigating positive youth development through sport with Portuguese coaches. Combined, these studies illustrated that Portuguese soccer and field hockey coaches recognize the importance of positive youth development within their sport and coaching role (e.g., the development of life skills in their athletes). However, these studies also highlighted that a greater emphasis on positive youth development is needed within coach education programs for these particular sports. Within Brazil, research into sport-based intervention programs targeted at disadvantaged groups (e.g., the Vencer program in Rio's slums) have also highlighted that sport has the potential to teach young people key life skills such as teamwork, communication, and social skills (Spaaij, 2012). Overall, the above studies illustrate that researchers/practitioners within Portuguese-speaking countries are invested in the area of positive youth development through sport. As such, the development of a Portuguese version of the LSSS would pave the way for future quantitative studies into life skills development through sport within Portuguese-speaking populations.

Therefore, the purpose of this research was to conduct a series of studies which adaptated the LSSS into Portuguese (P-LSSS) and thoroughly assessed the construct validity of the new scale. More specifically, based on Messick's (1995) unified concept of validity, we assessed the content, substantive, structural, and external aspects of construct validity across three studies. Given our aim was to develop a scale to assess

life skills development in youth sport with Portuguese-speakers (i.e., to generalize the scale to another population), we also addressed the generalizability aspect of construct validity (Messick, 1995) through our research.

Study 1 – Content and substantive aspects of construct validity

The purpose of Study 1 was to translate and adapt the LSSS (Cronin & Allen, 2017) into Portuguese. During this process it was particularly important to maintain the relevance, representativeness, and technical quality of the scale items, as these are key elements of the content and substantive aspects of construct validity (Messick, 1995). Content validity is defined as "the degree to which elements of an assessment instrument are relevant to and representative of the targeted construct" (Haynes, Richard, & Kubany, 1995, p. 239). Generally speaking, content validity requires the use of recognized subject experts to evaluate whether test items adequately assess a defined construct (Pasquali, 2010). The substantive aspect of construct validity refers to the importance of theories and process modeling in examining the domain processes that are involved in the assessment task (Messick, 1995). According to Messick (1995), this concept has some overlap with content validity and includes appropriate sampling of domain processes, coverage of domain content – along with providing evidence that the sampled processes are engaged with by respondents.

Methods and materials

Participants

During this study, a translation and cross-cultural adaptation expert group was assembled and consisted of nine professionals (four translators and five academics) who oversaw the translation, adaptation, and content validation process. The translators were professionals with expertise in the translation of scientific texts and part of their academic training was in English-speaking countries (i.e., they spoke the English

language). All of the academics were from Brazil and spoke Portuguese as their first language and two spoke English as a second language. These academics all possessed PhDs in physical education/psychology – with a particular emphasis on sports psychology. During this first study, a pilot study assessing the comprehension of scale items was also conducted with a group of 25 Brazilian youth sport participants aged between 13–18 years (i.e., a sample of participants that the scale would be used with in the future).

Instrument and procedures

As mentioned previously, the LSSS (Cronin & Allen, 2017) was adapted within this study. The LSSS is a 43-item measure that asks participants to ‘‘rate how much your sport has taught you to perform the skills listed below”. The stem for each question is “This sport has taught me to…” and responses are provided on a 5-point scale ranging from 1 (*not at all*) to 5 (*very much*). Example items include: teamwork (7 items; ‘‘work well within a team/group”); goal setting (7 items; “set specific goals”); time management (4 items; “manage my time well’’); emotional skills (4 items; “use my emotions to stay focused”); interpersonal communication (4 items; “communicate well with others”); social skills (5 items; “interact in various social settings”); leadership (8 items; “organize team/ group members to work together”); and problem solving and decision making (4 items; “think carefully about a problem”).

The first step in assuring the content and substantive aspects of construct validity was to accurately translate the LSSS from English to Portuguese. Using a five-point Likert scale (1 = *not at all*, 5 = *very much*), each member of the expert group was asked to evaluate the theoretical relevance and language clarity of each translated item. Specifically, the experts were asked to rate each item in terms of its clarity (e.g., easy to understand), relevance (e.g., if the item should be included in the test), and to classify

the subscale the item relates to (e.g., what life skill did the item assess). Such an approach ensured the relevance, representativeness, and technical quality of the scale items. Moreover, recent studies have taken this approach when adapting/translating a scale into another language (Monteiro, Moutão, & Cid, 2018; Rigoni, Nascimento Junior, Belem, Vieira, & MacDonald, 2018). Following initial translation, a back translation to English was also performed to ensure the accuracy of the Portuguese translation (Vallerand, 1989). Across the Portuguese translation and the English back-translation, vocabulary issues were discussed and minor adjustments were made to the wording of items by the expert group.

In the pilot study we conducted, the 25 youth sport participants firstly provided their informed consent to participate and then completed the translated scale, along with being questioned about their comprehension of the scale items (Marôco, 2010). In essence, the participants were asked to inform the researchers of any difficulties they had in comprehending any of the items. This approach of using a small sample of participants to ensure the comprehension of items within the target population has been utilized in other scale validation studies (e.g., Payne, Hudson, Akehurst, & Ntoumanis, 2013). Based on information provided by participants in our pilot study, further minor modifications to the wording of items resulted in a Portuguese version of the LSSS (Cassepp-Borges, Balbinotti, & Teodoro, 2010). Specifically, the minor modifications involved altering the wording of some items in Portuguese. For example, the teamwork item “Ajudar outros membros de uma equipe/grupo a executar uma tarefa” was changed to “Ajudar outros membros da equipe/grupo a executar uma tarefa”, and the social skills item “Ajudar os outros sem eles pedirem por ajuda” was changed to “Ajudar os outros sem eles pedirem ajuda”.

Content validity data analyses

Theoretical analysis of the 43 items of the newly developed P-LSSS was performed through a content validity assessment (Hernández-Nieto, 2002). This technique checks experts' agreement regarding the classification of items into their specific dimensions (e.g., teamwork items are correctly classified into the teamwork dimension). As part of the content validity assessment, an analysis of language clarity and practical relevance was also conducted by calculating a coefficient of content validity for each item (CCVi) and for the dimensions and questionnaire as a whole (CCVt). For the content validity coefficient calculation, a cutoff of .80 was used to indicate adequate content validity (Hernández-Nieto, 2002). To analyze the concordance between judges, Kappa coefficient was used with values of .80 or above deemed acceptable for this measure (Nunnally & Bernstein, 1994). Past studies have also taken this approach to content validity data analyses (e.g., Rigoni et al., 2018).

Results

The use of a translation and cross-cultural adaptation expert group to accurately translate the scale into Portuguese – along with pilot testing the scale on a sample of youth sport participants to assess item comprehension – ensured the relevance, representativeness, and technical quality of the scale items, which are key elements of the content and substantive aspects of construct validity (Messick, 1995). The results of the content validity analyses also demonstrated that the P-LSSS items and its dimensions had clarity of language and practical relevance with coefficients above .80 (CCVi = .91 to 1.00; CCVt = .93 to 1.00). This finding suggests that the P-LSSS presents clear language to Portuguese-speaking youth sport participants, whilst also being relevant to the sporting context. P-LSSS item classification agreement among experts (Kappa coefficient) for teamwork, goal setting, social skills, problem solving and decision making, emotional skills, leadership, time management, and interpersonal

communication skills was .86, indicating that items corresponded to their correct underlying dimension. Combined, our findings from the expert group and a sample of youth sport participants provided evidence for the content and substantive aspects of construct validity for the scale.

Study 2 – Structural aspects of construct validity

The purpose of Study 2 was to assess the structural aspect of construct validity for the P-LSSS. Specifically, we sought to confirm the factor structure of scores obtained from the scale with a large sample of Brazilian youth sport participants. During this study, we also tested the internal consistency reliability of the P-LSSS subscale scores.

Methods and materials

Recruitment

Prior to collecting data for this study, approval was received from the host university's research ethics and integrity office. Additionally, each participant also provided informed consent before completing the survey. Our inclusion criteria for the study meant that athletes had to have taken part in sport competitions for at least one year and belong to one of the teams taking part in the sports tournament where the data was collected. Data collection was conducted in the athletes' accommodation and training venues during a sports tournament that took place in Brazil.

Measure and participants

The 43-item P-LSSS which was described in Study 1 was used to assess participants perceived development of eight life skills: teamwork, goal setting, time management, emotional skills, interpersonal communication, social skills, leadership, and problem solving and decision making. The complete P-LSSS can be seen in Appendix A.

During this study, 475 youth athletes from all regions of Brazil participated in the research which involved completing the P-LSSS. However, 62 athletes were

excluded from the final sample as they did not respond adequately to the survey (i.e., they failed to respond to numerous items/subscales). As a result, 413 athletes aged between 10–21 years were included in the final sample (male = 277, female = 136; M_{age} = 16.27 years; *SD* = 3.33). Specifically, the participants included those in early (10–14 years, *n* = 169), middle (15–18 years, *n* = 104), and late adolescence (19–21 years, *n* = 140) based on Steinberg's (1993) conceptualization. The athletes reported an average practice time of 21.24 hours per week (*SD* = 18.06) and were members of their current team for an average of 14.90 months (*SD* = 8.71). Participants represented the following sports: track and field (*n* = 78), badminton (*n* = 3), basketball (*n* = 19), beach volleyball (*n* = 2), handball (*n* = 72), indoor football (*n* = 132), football (*n* = 71), judo (*n* = 26), swimming (*n* = 9) and cycling (*n* = 1).

Data analyses

We began our data analyses by calculating intraclass correlation coefficients (ICCs) at the sport level using MLwiN Version 3.01 (Rasbach, Steele, Browne, & Goldstein, 2017). The mean ICC for the study variables was .01 (range = 0 to .05). As these values were below the .10 threshold for multilevel modelling to be appropriate (Preacher, Zhang, & Zyphur, 2011), we proceeded with our analyses at the individual level. To assess and confirm the factor structure of scores obtained from the P-LSSS, confirmatory factor analysis (CFA) employing robust maximum likelihood estimation was conducted using Mplus software (Version 7.4; Muthén & Muthén, 2012). In line with recommendations from the literature (e.g., Chou, Bentler, & Satorra, 1991), robust maximum likelihood estimation was used as the data departed from multivariate normality. Specifically, Mardia's (1970) normalized estimate of multivariate kurtosis (77.98, $p < .001$) was above the 5.00 mark which Bentler (2005) suggested is indicative of multivariate non-normality. The following models were tested: an eight-factor model

representing all eight life skills, a first-order model that only included a total life skills factor, and a bifactor CFA model which included all eight life skills and a total life skills factor. In line with Myers et al.'s (2016) recommendation, the bifactor CFA model was based on substantive measurement theory; namely, the Cronin and Allen (2017) study which illustrated the presence of specific factors for the eight life skills and a total life skills factor within the scale. The following fit indices were used to assess model fit: chi-square statistic divided by degrees of freedom (χ^2/df), Root Mean Square Error of Approximation (RMSEA; Stieger & Lind, 1980), Comparative Fit Index (CFI; Bentler, 1990), and the Tucker Lewis Index (TLI; Tucker & Lewis, 1973). To begin with, a χ^2/df of less than 3.0 was indicative of adequate fit (Tabachnick & Fidell, 2013). In line with Marsh, Hau, and Wen's (2004) recommendations, an RMSEA value of less than .08 or .05 represented a reasonable or close fit to the data respectively; whereas, CFI and TLI values greater than .90 or .95 indicated acceptable and excellent fit respectively. To assess the internal consistency reliability of the P-LSSS subscales, Cronbach's alpha coefficients were also calculated. According to Nunnally and Bernstein (1994), alpha coefficients above .70 indicate acceptable internal consistency reliability. Composite reliability was also calculated using CFA results, given that this measure provides an index of internal consistency of the instrument dimensions through the factor loadings of the respective items. Values greater than .70 were considered indicators of suitable composite reliability (Tabachnick & Fidell, 2013).

Results

Factor structure assessment

Table 1 contains the fit indices for the three CFA models tested. From this table, we can see that the eight-factor and bifactor models both displayed an acceptable fit; whereas,

the first-order model displayed a poor fit. Given that the size and complexity of a model can adversely affect model fit (Cheung & Rensvold, 2002), it was encouraging that both the eight-factor and bifactor models which included 43 items representing eight life skills displayed an acceptable fit.

[TABLE 1]

Table 2 contains the factor loadings for the eight-factor and bifactor models that displayed an adequate fit. The average factor loading for the eight-factor model was .66 (Range = .46–.81). Within the bifactor model, all 43 P-LSSS items loaded significantly onto the total life skills factor (*M* factor loading = .55, Range = .39–.66). This indicates that all eight subscales of the P-LSSS can be combined to calculate a total life skills score. Additionally, 39 of the items loaded significantly onto their specific life skill factor (*M* factor loading = .39, Range = .22–.71). One social skills item, two leadership items, and one interpersonal communication skills item failed to load onto their specific life skills factor indicating that these items were more representative of a total life skills factor. These items were retained to ensure that all components of the life skills were represented in these subscales (i.e., these items each represented a key component of the life skill in question). It was also important to retain these items to maintain the content and substantive aspects of construct validity for the scale (Messick, 1995).

[TABLE 2]

Table 3 contains the correlations between the eight life skills. These correlations ranged from .34 to .71. (*M* correlation = .55). Importantly, none of the correlations were greater than the .80 mark often used to identify poor discriminant validity (Brown, 2006).

[TABLE 3]

Internal consistency reliability

The Cronbach's alpha coefficients for each of the subscales and total life skills were as follows: teamwork (.76), goal setting (.85), social skills (.77), problem solving and decision making (.79), emotional skills (.78), leadership (.87), time management (.81), interpersonal communication skills (.79), and total life skills (.95). These alpha coefficients were all above the .70 recommended by Nunnally and Bernstein (1994) for adequate internal consistency reliability. The composite reliability values were as follows: teamwork (.77), goal setting (.85), social skills (.78), problem solving and decision making (.79), emotional skills (.78), leadership (.87), time management (.82), interpersonal communication skills (.79), and total life skills (.97). All of the values were above the .70 criteria for adequate composite reliability (Tabachnick & Fidell, 2013).

Study 3 – External aspect of construct validity

The purpose of this study was to test whether the P-LSSS subscale scores (i.e., the eight life skills and total life skills) correlated with theoretically relevant outcomes in order to test the external aspect of construct validity (Messick, 1995). According to self-determination theory (SDT; Ryan & Deci, 2017) – which is considered a theory of human development – intrinsic motivation (i.e., the most self-determined form of motivation) has been found to be positively related to adaptive outcomes in several domains including sport. Based on the tenets of SDT (Ryan & Deci, 2017), we sought to assess if more self-determined forms of motivation (i.e., intrinsic motivation, integrated regulation, and identified regulation) had positive relationships with the life skills, as compared to less self-determined forms of motivation (i.e., introjected regulation, external regulation, and amotivation) which ought to have negative relationships or no relationships with the life skills. In line with this proposition, past research by Inoue, Wegner, Jordan, and Funk (2015) has shown that self-determined

motivation is positively associated with developmental outcomes in youth sport participants. Other studies have also shown that more self-determined forms of motivation are positively associated with adaptive outcomes in sport and less self-determined forms of motivation have no relationships or negative relationships with adaptive outcomes in sport (Carpentier & Mageau, 2016; Hodge & Lonsdale, 2011; Fenton, Duda, Quested, & Barrett, 2014; Langan et al., 2016; Sheehy & Hodge, 2015). Specific to the different forms of motivation highlighted earlier, Langan et al. (2016) found that intrinsic motivation, integrated regulation, and identified regulation were positively associated athletes' perceptions of flow in sport; whereas, introjected regulation had no association and external regulation had a negative association with athletes' perceptions of flow. Similarly, Sheehy and Hodge (2015) found that intrinsic motivation, integrated regulation, and identified regulation were positively associated athletes' prosocial behavior in sport; whereas, introjected regulation, external regulation, and amotivation had no association with athletes' prosocial behavior.

Methods and materials

Participants and measures

The sample consisted of 134 youth sport participants (male = 71, female = 63) between 11–17 years old (M_{age} = 13.62; *SD* = 1.23). Participants represented the following sports: handball (*n* = 64), indoor football (*n* = 44), and football (*n* = 26).

To assess the participant's life skills development, the 43-item P-LSSS described in Study 1 and 2 was used. With the current sample, the P-LSSS subscales displayed Cronbach's alpha coefficients ranging from .75 to .90 (see Table 4), which supported the internal consistency reliability of the subscales (Nunnally & Bernstein, 1994).

To assess participants' self-determined motivation, we used the Behavioral Regulation in Sport Questionnaire (BRSQ) - Portuguese Version (Monteiro, Moutão, & Cid, 2018). Participants responded to the following stem: "Below are some reasons why people participate in sport. Using the scale provided, please indicate how true each of the following statements is for you". The BRSQ consists of 24 items distributed into six factors: intrinsic motivation (e.g., "because I find it pleasurable"); integrated regulation (e.g., "because it's an opportunity to just be who I am"); identified regulation (e.g., "because I value the benefits of my sport"); introjected regulation (e.g., "because I would feel ashamed if I quit"); external regulation (e.g., "because I feel pressure from other people to play"); and amotivation (e.g., "but I wonder what's the point"). Participants responded to the items using a 7-point Likert scale (1 = *not true at all* to 7 = *very true*). Past research has supported the validity and reliability of the BRSQ with Portuguese-speaking athletes (Monteiro et al., 2018). With the current sample, the BRSQ subscales displayed adequate Cronbach's alpha coefficients (see Table 4) ranging from .71 to .77 (Nunnally & Bernstein, 1994).

Data Analysis

Pearson's product-moment correlation coefficients were used to assess the relationships between participants' perceived life skills development and the various forms of motivation measured by the BRSQ. A p value of less than .05 was required to indicate a statistically significant relationship between variables. Within our analyses, correlations were judged as small ($r = \pm .10$ to $\pm .29$), medium ($r = \pm .30$ to $\pm .49$), or large ($r > \pm .50$) based on Cohen's (1988) criteria.

Results

From Table 4 we can see that the eight life skills and total life skills displayed significant and positive correlations with more self-determined forms of motivation

(i.e., intrinsic motivation, integrated regulation and identified regulation). These significant positive correlations ranged from .14 to .33 in size. The only exception was goal setting, which showed no significant relationship with intrinsic motivation (r =.08). All of the significant positive correlations were small in size, apart from the medium-sized positive correlation between interpersonal communication skills and identified regulation (r = .33). In contrast to the more self-determined forms of motivation, there was a lack of statistically significant relationships between the eight life skills/total life skills and less self-determined forms of motivation (i.e., introjected regulation, external regulation, and amotivation). Specifically, the only significant relationships were small negative associations between interpersonal communication skills and external regulation (r = -.17), and social skills and external regulation (r = -.12). Overall, the above findings supported our hypothesis that more self-determined forms of motivation would be positively associated with the life skills, as compared to less self-determined forms of motivation, which would show no associations or negative associations with the life skills.

[TABLE 4]

General discussion

This program of research adapted the LSSS (Cronin & Allen, 2017) to Portuguese and provided evidence for the content, substantive, structural, and external aspects of construct validity using scores obtained from the scale. The three studies described in this article are the first to investigate the cross-cultural adaptation and psychometric properties of this scale amongst Portuguese-speaking youth sports participants. Developing a scale that generalizes to other populations also addresses the generalizability aspect of construct validity highlighted by Messick (1995). Overall, our findings provided initial evidence for the construct validity of the P-LSSS scores with

Portuguese-speaking sports participants. Each of the three studies we conducted and the aspects of construct validity they were assessing are discussed below.

Study 1 adapted and translated the scale into Portuguese and provided evidence for the content and substantive aspects of construct validity for the items contained in the scale. It is important to highlight that the process of translation and adaptation of the scale from English to Portuguese required a lot of care in order to obtain the final version of the scale which was suitable for Portuguese speakers. Specifically, we utilized content experts (i.e., academics with expertise in sport psychology), professional translators, and a sample of youth sports participants to ensure that the content validity of the original scale was maintained when translated into the Portuguese language. The process we followed to ensure an accurate translation to Portuguese (Vallerand, 1989) and the fact that the content validity of the scale was maintained was particularly important, as Gunnell et al. (2014) highlighted that content validity is often neglected during the development/adaptation of scales in the sport and exercise psychology literature.

Study 2 provided evidence for the structural aspects of construct validity of the P-LSSS with a large sample of youth sports participants. Specifically, an eight-factor structure representing each of the eight life skills – along with a bi-factor model including a total life skills factor – was supported with scores from this sample of participants. These findings, along with the adequate internal consistency reliability for each subscale and total life skills, indicate that the P-LSSS can be used to investigate the development of each of the eight life skills separately and total life skills combined. More importantly, the findings from the current study support the factorial validity and internal consistency reliability evidence that has been provided for the LSSS with

English-speaking youth sports participants (e.g., Cronin & Allen, 2017, 2018; Mossman & Cronin, 2018).

Study 3 provided evidence for the external aspect of construct validity for the scale by illustrating that more self-determined forms of motivation (e.g., intrinsic motivation, integrated regulation and identified regulation) had positive relationships with participant's life skills scores. The only exception was the lack of a relationship between participants' scores for goal setting and intrinsic motivation – a finding which future studies should try to replicate or investigate further with youth sport participants. Also supporting the external aspect of construct validity was the finding that less self-determined forms of motivation (e.g., introjected regulation, external regulation and amotivation) had no significant relationships with participant's life skills development scores. The only exceptions were two negative associations between external regulation and interpersonal communication and social skills, which still aligned with our hypothesis. Overall, our findings supported Ryan and Deci's (2017) SDT based proposition that more self-determined forms of motivation are positively related to people's development and less self-determined forms of motivation are not associated or negatively associated with people's development. In addition, our findings supported Inoue et al.'s (2015) study which found that self-determined motivation is positively related to developmental outcomes in youth sports participants. Finally, the pattern of relationships we found between the different forms of motivation and the life skills scores were similar to past studies assessing other positive outcomes in sport (e.g., Langan et al., 2016; Sheehy & Hodge, 2015).

Limitations and future research recommendations

The three studies within this article have some limitations that should be considered. Firstly, given that only 10 different sports were included in our studies and

some sports only had a small number of participants (e.g., badminton, beach volleyball, cycling), future research should sample a greater number and wider variety of sports which are played within Portuguese-speaking countries. This is especially the case as the original version of the LSSS (Cronin & Allen, 2017) was tested across a wider variety of sports. Secondly, as a smaller number of female participants were included across our studies, future research should include a larger number of female participants to ensure a greater gender balance. Such an approach would allow for the invariance of the scale to be tested across gender. Additionally, a larger sample size would allow for the invariance of the scale to be tested across different age groups. Addressing the above points would also provide further evidence for the generalizability aspect of construct validity of the P-LSSS. A related point is that future studies should look to assess whether the clustering of individuals within teams effects the results of factorial validity testing and other forms of psychometric testing using the scale. Finally, a limitation of the current research is that only certain elements of construct validity were tested across our three studies. Building on our positive findings, future studies should look to assess additional aspects of construct validity that have been highlighted by Messick (1995). For instance, future studies could address the consequential aspect of construct validity by examining whether the scale can be used as a 'basis for action' (e.g., to develop life skills interventions based on participants' results on the P-LSSS). Assessing additional aspects of construct validity is important as evidencing aspects of validity should be viewed as an ongoing process (DeVellis, 2011). Furthermore, future studies should also look to replicate our positive findings in relation to the construct validity of the P-LSSS in other large samples of youth sports participants.

Practical implications

Overall, our positive findings in relation to the P-LSSS are an important development for the life skills development through sport literature. To begin with, the P-LSSS will allow both practitioners and researchers to accurately assess life skills development in Portuguese-speaking youth sports participants. This is a particularly important finding as Portuguese is a widely spoken language across the world (Parkinson, 2017) and the scale will help address the fact that research on positive youth development through sport has focused primarily on English-speaking populations from North America (Santos et al., 2016). Specifically, the P-LSSS will allow researchers to extend the research findings showing that English-speaking sports participants develop life skills through sport (e.g., Johnston et al., 2013; Pierce et al., 2017) to Portuguese-speaking populations. Given the interest in positive youth development through sport in both Portugal and Brazil (e.g., Santos et al., 2017a, Santos et al., 2017b; Spaiij, 2012), we believe that the P-LSSS will prove a useful tool for investigating sports-based programs aimed at developing life skills in these countries. Moreover, researchers working in Portuguese-speaking countries can use the scale to investigate theories (e.g., SDT; Ryan & Deci, 2017) which may help explain the mechanisms by which young people develop their life skills through sport.

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Table 1
Indices of Model Fit for the Portuguese Version of the Life Skills Scale for Sport

Model	χ^2	*df*	χ^2 / *df*	RMSEA	CFI	TLI
Eight-factor model	1180.54***	832	1.42	.03	.94	.93
First-order model	2116.85***	860	2.46	.06	.78	.77
Bifactor model	1161.17***	817	1.42	.03	.94	.93

Note. N = 413. RMSEA = root mean square error of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index.
***p < .001.

Table 2

Standardized Factor Loadings for the Eight-Factor and Bifactor Models

	Eight-Factor Model		Bifactor Model		
Item	FL	Uniqueness	Specific	General	Uniqueness
TW1	.54***	.71***	.40***	.40***	.68***
TW2	.56***	.68***	.36***	.43***	.69***
TW3	.46***	.78***	.27***	.39***	.78***
TW4	.57***	.68***	.53***	.39***	.57***
TW5	.66***	.57***	.32***	.55***	.60***
TW6	.59***	.65***	.24***	.49***	.70***
TW7	.56***	.69***	.41***	.40***	.67***
GS1	.64***	.59***	.34***	.53***	.60***
GS2	.68***	.53***	.41***	.53***	.55***
GS3	.73***	.47***	.39***	.60***	.49***
GS4	.69***	.53***	.45***	.54***	.51***
GS5	.68***	.54***	.39***	.57***	.53***
GS6	.67***	.55***	.51***	.48***	.50***
GS7	.63***	.61***	.40***	.49***	.60***
SS1	.60***	.64***	.41***	.48***	.60***
SS2	.74***	.46***	.71***	.56***	.18
SS3	.62***	.61***	.26***	.52***	.66***
SS4	.70***	.51***	.29***	.58***	.58***
SS5	.57***	.68***	.01	.59***	.65***
PS1	.70***	.52***	.29**	.61***	.55***
PS2	.77***	.41***	.39**	.66***	.41***
PS3	.64***	.59***	.44***	.53***	.53***
PS4	.68***	.54***	.29**	.61***	.55***
ES1	.73***	.47***	.51***	.53***	.46***
ES2	.79***	.38***	.68***	.53***	.25***
ES3	.61***	.63***	.36***	.45***	.67***
ES4	.62***	.61***	.26***	.53***	.65***
LS1	.74***	.46***	.37***	.66***	.43***
LS2	.72***	.48***	.38**	.63***	.45***
LS3	.68***	.54***	.29***	.62***	.53***
LS4	.71***	.50***	.38**	.61***	.48***
LS5	.72***	.48***	.31*	.64***	.50***
LS6	.67***	.55***	.14	.65***	.56***
LS7	.61***	.63***	.22*	.56***	.64***
LS8	.53***	.72***	.02	.54***	.71***
TM1	.67***	.56***	.31***	.57***	.58***

TM2	.74***	.45***	.56***	.50***	.44***
TM3	.81***	.35***	.69***	.53***	.24***
TM4	.70***	.51***	.42***	.53***	.54***
CS1	.75***	.44***	.34***	.66***	.44***
CS2	.73***	.48***	.44***	.64***	.39***
CS3	.68***	.54***	.29***	.61***	.55***
CS4	.65***	.58***	.14	.62***	.60***

Note. FL = Factor Loading; TW = Teamwork; GS = Goal setting; TM = Time management; ES = Emotional skills; CS = Interpersonal communication skills; SS = Social skills; LS = Leadership skills; PS = Problem solving & decision making.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 3

Correlations Between the Eight Life Skills in Study 2

	1	2	3	4	5	6	7	8
1. Teamwork	-	.55***	.54***	.52***	.40***	.64***	.34***	.49***
2. Goal setting		-	.55***	.56***	.51***	.60***	.56***	.55***
3. Social skills			-	.65***	.46***	.62***	.41***	.60***
4. Problem solving & decision making				-	.55***	.63***	.49***	.62***
5. Emotional skills					-	.56***	.52***	.52***
6. Leadership						-	.57***	.71***
7. Time management							-	.60***
8. Interpersonal communication skills								-

***$p < .001$.

Table 4

Correlations Between Participants' Life Skills Scores and the *Components of Motivation*

	Life Skills									Components of motivation					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Teamwork	(.74)	.64**	.45**	.42**	.49**	.58**	.59**	.54**	.70**	.22**	.21**	.21**	-.03	-.04	-.03
2. Goal setting		(.82)	.62**	56**	.55**	.70**	.64**	.65**	.81**	.08	.14*	.14*	-.01	-.03	-.01
3. Time management			(.75)	.62**	.72**	.59**	.69**	.65**	.83**	.21**	.25**	.29**	.03	-.10	.01
4. Emotional skills				(.76)	.58**	.58**	.66**	.57**	.78**	.20*	.17*	.15*	.01	-.08	.03
5. Interpersonal communication					(.77)	.65**	.72**	.62**	.82**	.24**	.28**	.33**	-.05	-.17*	-.09
6. Social skills						(.75)	.64**	.74**	.84**	.21**	.14*	.23**	-.03	-.12*	-.05
7. Leadership							(.86)	.66**	.86**	.18*	.22**	.23**	.10	-.01	.05
8. [a]Problem solving								(.74)	.84**	.18*	.21**	.24**	.03	-.06	-.02
9. Total life skills									(.95)	.21*	.23**	.27**	.01	-.08	-.01
10. Intrinsic Motivation										(.77)	.68**	.72**	-.18*	-.20*	-.08
11. Integrated Regulation											(.72)	.66**	-.06	-.18*	-.03
12. Identified Regulation												(.71)	.05	-.13*	-.01
13. Introjected Regulation													(.75)	.71**	.65**
14. External Regulation														(.77)	.77**
15. Amotivation															(.72)

Note. $N = 134$. Correlations were Pearson's product-moment correlation coefficients. [a]Problem solving = problem solving & decision making. Alpha coefficients for each subscale are contained within the parentheses.

*$p < .05$; **$p < .01$; *** $p < .001$.

1

2

Appendix A

Portuguese Version of the Life Skills Scale for Sport

Pessoas jovens têm vários tipos de experiência e podem aprender muito ao praticar esporte. Essas questões perguntam sobre as habilidades que você pode ter apreendido por meio da prática do seu esporte preferido. Por favor, responda as questões circulando o número à direita de cada afirmação. Não existem respostas certas ou erradas, então, por favor, responda mais honestamente possível. Por favor, avalie o quanto seu esporte tem te ensinado a utilizar essas habilidades listadas abaixo.

Trabalho em equipe					
Esse esporte tem me ensinado a...	**Nada**	**Um pouco**	**Moderadamente**	**Bastante**	**Extremamente**
1. Trabalhar bem em equipe/grupo	1	2	3	4	5
2. *Ajudar outros membros da equipe/grupo a executar uma tarefa	1	2	3	4	5
3. Aceitar sugestões de outras pessoas para melhora pessoal	1	2	3	4	5
4. Trabalhar com outras pessoas para o bem da equipe/grupo	1	2	3	4	5
5. Ajudar a construir o espírito de equipe/grupo	1	2	3	4	5
6. Sugerir para membros da equipe/grupo como eles podem melhorar seu desempenho	1	2	3	4	5
7. Mudar a forma de jogar para o beneficio da equipe/grupo	1	2	3	4	5
Estabelecimento de metas					
Esse esporte tem me ensinado a...	**Nada**	**Um pouco**	**Moderadamente**	**Bastante**	**Extremamente**
8. Estabelecer metas para que eu possa ficar concentrado em	1	2	3	4	5

melhorar					
9. Estabelecer metas desafiadoras	1	2	3	4	5
10. Checar o progresso em relação às minhas metas	1	2	3	4	5
11. Estabelecer metas de curto prazo para atingir metas a longo prazo	1	2	3	4	5
12. Continuar comprometido com minhas metas	1	2	3	4	5
13. Estabelecer metas para os treinos	1	2	3	4	5
14. Estabelecer metas específicas	1	2	3	4	5
Habilidades sociais					
Esse esporte tem me ensinado a...	**Nada**	**Um pouco**	**Moderadamente**	**Bastante**	**Extremamente**
15. Começar uma conversa	1	2	3	4	5
16. Interagir em vários ambientes sociais	1	2	3	4	5
17. *Ajudar os outros sem eles pedirem ajuda	1	2	3	4	5
18. Se envolver em atividades de grupo	1	2	3	4	5
19. Manter amizades próximas.	1	2	3	4	5
Resolução de problemas					
Esse esporte tem me ensinado a...	**Nada**	**Um pouco**	**Moderadamente**	**Bastante**	**Extremamente**
20. Pensar cuidadosamente sobre um problema	1	2	3	4	5
21. Comparar cada solução possível para achar a melhor opção	1	2	3	4	5
22. Criar o máximo de soluções possíveis para um problema	1	2	3	4	5
23. Avaliar a solução para um problema	1	2	3	4	5
Habilidades emocionais					
Esse esporte tem me ensinado a...	**Nada**	**Um pouco**	**Moderadamente**	**Bastante**	**Extremamente**
24. Saber como lidar com minhas emoções	1	2	3	4	5
25. Usar minhas emoções para me manter concentrado.	1	2	3	4	5
26. Entender que eu me comporto de forma diferente quando estou emocionado	1	2	3	4	5

27. *Perceber como eu me sinto	1	2	3	4	5
Liderança					
Esse esporte tem me ensinado a...	**Nada**	**Um pouco**	**Moderadamente**	**Bastante**	**Extremamente**
28. Saber como influenciar de forma positiva um grupo de indivíduos	1	2	3	4	5
29. Organizar membros do time/grupo para trabalhar juntos	1	2	3	4	5
30. Saber como motivar os outros	1	2	3	4	5
31. Ajudar os outros a resolverem seus problemas de *performance*	1	2	3	4	5
32. Considerar as opiniões individuais de cada membro de uma equipe/grupo	1	2	3	4	5
33. Ser um bom exemplo para os outros	1	2	3	4	5
34. Definir padrões altos para o time/grupo	1	2	3	4	5
35. Reconhecer as conquistas das outras pessoas	1	2	3	4	5
Controle do tempo					
Esse esporte tem me ensinado a...	**Nada**	**Um pouco**	**Moderadamente**	**Bastante**	**Extremamente**
36. *Administrar bem meu tempo	1	2	3	4	5
37. Avaliar quanto tempo eu gasto em cada atividade	1	2	3	4	5
38. Controlar como eu uso meu tempo	1	2	3	4	5
39. Estabelecer metas para que eu use meu tempo de forma efetiva	1	2	3	4	5
Comunicação					
Esse esporte tem me ensinado a...	**Nada**	**Um pouco**	**Moderadamente**	**Bastante**	**Extremamente**
40. Falar de forma clara com os outros	1	2	3	4	5
41. Prestar atenção no que alguém está dizendo	1	2	3	4	5
42. Prestar atenção na linguagem corporal da pessoa	1	2	3	4	5
43. Comunicar bem com outras pessoas	1	2	3	4	5

***Items which had there wording altered during Study 1.**