Original article

Transcultural adaptation and psychometric properties of the Spanish version of the Life Skills Scale For Sport: LSSS-S

Adaptación transcultural y propiedades psicométricas de la versión en español de la Escala de Habilidades para la Vida para el Deporte: LSSS-S

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Abstract

Objective: The aim of this study was to translate and validate into Spanish the Life Skills Scale for Sport (LSSS) designed and validated by Cronin and Allen. The scale is divided into eight sub-dimensions: goal-seeking, teamwork, time management, emotional skills, interpersonal communication, social skills, leadership, and problem solving. **Method:** For the translation process, a validation between languages was performed. A double procedure was carried out with bilingual researchers related to the subject, translating from English to Spanish and, conversely. Subsequently for validation, 1251 students (59.8% women) between 15 and 29 years old from Spain and Chile answered the questionnaire. **Results:** Comparing initial results, the translated terms matched, and no relevant mismatch was found. The confirmatory factor analysis supported the factorial structure proposed by the original authors, showing acceptable fit indicators (RMSEA: 0.048; CFI: 0.93; TLI: 0.92), satisfactory internal consistency coefficient (0.980) and adequate item-total correlation (0.630). **Conclusion:** The instrument proves to be consistent in the evaluation of life skills in the Spanish-speaking population, presents adequate psychometric properties and is a reliable and valid instrument for the evaluation of life skills in contexts of physical activity and sport with a young population aged 15 to 29 years.

Keywords: assessment; physical activity; sports; life skills

Resumen

Objetivo: El objetivo de este estudio fue traducir y validar al español la Escala de Habilidades para la Vida para el Deporte diseñada y validada por Cronin y Allen. La escala se divide en ocho subdimensiones: trabajo en equipo, búsqueda de objetivos, gestión del tiempo, habilidades emocionales, comunicación interpersonal, habilidades sociales, liderazgo y resolución de problemas. **Método:** Para el proceso de traducción se realizó una validación entre idiomas. Se realizó un doble procedimiento con investigadores bilingües y relacionados con el tema, traduciendo del inglés al español y viceversa. Posteriormente para la validación, respondieron al cuestionario 1251 estudiantes (59,8% mujeres) entre 15 y 29 años de España y Chile. **Resultados:** Comparando los resultados iniciales, los términos traducidos coincidían y no se encontró ningún desajuste relevante en la terminología. El análisis factorial confirmatorio apoyó la estructura factorial propuesta por los autores originales, mostrando indicadores de ajuste aceptable (RMSE: 0.048; CFI: 0.93; TLI: 0.92), una consistencia interna satisfactoria (0.980) y una correlación ítem-total adecuada. **Conclusión:** El instrumento demuestra ser consistente en la evaluación de habilidades para la vida en la población de habla hispana, presenta propiedades psicométricas adecuadas y es un instrumento fiable y válido para la evaluación de habilidades para la vida en contextos de actividad física y deporte con una población joven de 15 a 29 años.

Palabras clave: evaluación; actividad física; deporte; habilidades para la vida

Key points

- Psychometric properties aim to an adequate fit to the data. Cronbach Alpha was 0.980, reflecting high internal consistency of the scale.
- The scale reproduces results collected in the original scale develop by Cronin and Allen, and maintains all the items that compose them.
- The Life Skills Scale For Sport has shown to have adequate psychometric properties and is a reliable and valid for the evaluation of Life Skills.

Introduction

Currently, we live in a context of constant change and uncertainty that involves facing new challenges in education[1]. These new demands have caused numerous authors to focus their efforts on determining what competencies or skills must be learned to face the challenges of a fast-paced society, and that they also prepare individuals to be citizens and function properly in their adult lives.

Focusing in Life Skills (LS), the definition varies across disciplines[2]. For instance, to de World Health Organization[3], LS are defined as the capacity to adopt a positive behavior that allows to address the challenges of daily life and maintain a state of mental well-being through a positive and adaptable behavior in the interaction with other people and with the social and cultural environment. The development of these competences would favor in individuals a positive management and control of their own health and resistance to social-group pressure[3]. In the context of Physical Education and Sport, definitions close to the above can be found. For Danish et al.[4] LS are those that allow us to deal with the demands and challenges of everyday life. Such skills would allow young people to succeed in different contexts that are part of their daily lives, such as school, their own home and neighborhood. Other authors[5] also point out its importance to function in the work environment. These skills would be behavioral (e.g., effective communication), cognitive (e.g., effective decision-making), interpersonal (e.g., assertiveness), and intrapersonal (e.g., goal setting) Likewise, terms have been used to describe LS such as social-emotional learning, emotional intelligence, positive psychology, resilience and character education[6].

Childhood and adolescence are critical periods for their development. LS acquisition will influence decisions and trajectories about your health and well-being[7,8]. Regarding the young adult population, although the acquisition and improvement of these skills can be done throughout life, there are few programs and specific curricular configurations that include them, and these are mainly aimed at reducing risky behaviors such as substance abuse or the prevention of sexual diseases[9], prevention of mental illness[10] or the prevention of violent behavior[11].

Positive youth development (PYD) is a perspective born from positive psychology[12] and whose fundamental premise is that all children and young people are potential positive contributors to society and its immediate contexts. Sport is one of the ideal contexts for positive development and LS in young people (e.g., leadership, self-control) due to the high participation and nature of its context, which favors the involvement of subjects at an interactive, emotional and social level[13] and when an adequate structure is available[14,15]. Young people feel safe physically and psychologically in sports contexts, which favors the acquisition of LS[16]. For this reason, in the last 15 years, the number of studies investigating the potential of sport in this area has significantly increased[17–19] and the PYD has become one of the most studied and developed topics and fields in the area[20].

As a result, PYD has also become a key element in the Physical Education (PE) curriculum in many countries[21], emerging a multitude of different programs and models that focus on LS and have proven to be effective[22], both specific to sports contexts (e.g., Girls on the Run program[23]) as non-specific

but transferred and applied to it (e.g., The Five Cs Model[24]). The development of LS through sport has been the main topic of a wide variety of studies, which, in turn, involve a great diversity of variables. In some of them, the importance of the climate or context for their learning has been addressed, to try to understand what mechanisms and keys facilitate the development of LS in young people.

Self Determination Theory[25] is one of the promising theories for understanding such mechanisms[26]. The development of LS has been related, among others, to the satisfaction of basic psychological needs[17], intrinsic motivation and friendship goals[27], Personal and Social Responsibility[28], Well-being[29,30] or Prosocial behaviour[31]. Recently, some authors have equally focused on how those skills can be transferred from PE to other everyday contexts, because otherwise they could not be considered LS[32,33]. Learning these skills and transferring them to everyday reality is critical for all young people[29] but especially for those at risk or vulnerable[34]. For Pierce et al.[32] the transfer of LS in sport is the process by which the learning and improvement of a LS is related to this subsequent application in, at least, one or more context of their individual's daily life beyond sports or physical activity.

However, despite the fact that, in recent decades, the development of LS has acquired great prominence in research and a multitude of programs and models have been created and applied, only one instrument has been found for assessing LS in physical activity and sport context. Cronin and Allen develop this scale for youth participants in PYD and LS through sports programs, emphasizing ages between 11 to 21[26]. This scale was developed to measure how the youth perceive their own LS development in 8 dimensions (teamwork, goal setting, time management, emotional skills, interpersonal communication, social skills, leadership, management, and problem solving) through sport in different practice contexts. Regardless of this, there is still a lack of measurement and, above all, a lack of instruments to assess LS for non-English speaking researchers and practitioners[35]. This scale has been only translated and validated for Portuguese population by Nascimiento-Junior et al[18]. The authors made a transcultural validation of the instrument in 413 youth athletes from Brazil with ages between 10 and 21. That said, there is still an important gap assessing LS in Spanish speakers. Responding to this need, the objective of this research is to translate and validate into Spanish the *Life Skills Scale for Sport* designed and validated by Cronin and Allen[26].

Methods

Life Skills Scale for Sport

We used the English version of the *Life Skills Scale for Sports* (LSSS)[26]. To translate it to Spanish, we followed a double procedure. First, we asked bilingual and topic-related researchers to translate it from English to Spanish. Second, we asked another group of researchers to make translation from Spanish to English. In total, four bilingual researchers with Spanish as first language (2 Chilean and 2 Spanish) and three bilingual researchers with English as first language worked on the translation. Comparing both results we concluded that the terms translated coincided, and no relevant mismatch was found. The researchers put emphasis on cultural parlance, considering a neutral language for all Spanish speakers. Sequentially, the scale was applied to 124 people to assess the comprehension of the items, without receiving observations about it.

Original LSSS uses 43 items. The instruments items are evaluated through on a 5-point Likert scale, ranging from 1 (not at all) to 5 (very much), over sentences like "*sports have taught me that…*". The whole scale is divided into eight subdimensions: teamwork (seven items), goal-seeking (seven items), time management (four items), emotional skills (four items), interpersonal communication (four items), social skills (five items), leadership (eight items), and problem-solving and decision-making (four items). The instrument was typed in the "Google Forms" platform. Also, informed consent for ethical compliance

and information protection with a presentation letter explaining the objective of the study and emphasizing that the personal information was anonymous and confidential, were uploaded. Ethical approval was obtained from the Ethics Committee of the Community of Aragon (CEICA).

Participants

For this study, a convenience sampling of 1251 students (52% Chilean, 47% Spanish and 1% other nationalities) were surveyed during sports class or training (during school physical education, college training, community practice or sports club) living and studying in Chile and Spain. From the sample, 59.8% were women (n=748) and 40.2% were men (n=503). The average age is 19.7, ranging from 15 to 29. In addition, they were asked to state the sport they usually practice, and more than 20 different ones were answered including individual disciplines (such as weightlifting, climbing, tennis, boxing, etc.) and team sports (futsal, football, handball, basketball, volleyball, among others). The authors have defined the sample in this age range considering definitions of youth of the United Nations (15 to 24)[36] and the National Youth Institute of Chile (15 to 29)[37,38].

Psychometric properties

To validate the subdimensions proposed for the LSSS we used a confirmatory factor analysis over two different fitting models: bifactorial and second-order, following recent and similar research[18,39]. For the estimation procedure we used the R package lavaan (0.6-8), proposed by Roseel[40] which allows for maximum likelihood robust estimations, that follows literature recommendations for when data does not follow a normal distribution[18,41,42]. We preliminary checked for normality, and our data showed that multivariate normal distribution did not fit adequately to our sample (kurtosis test: 2908, p-value < 0.001; skewness test: 252, p-value < 0.001; normality test: 4.44, p-value < 0.001).

Two confirmatory factor analysis models were proposed according to Nascimiento-Junior et al[18] which are similar to those proposed by Wang et al.[39] in educational research. These models are i) an eight factor model which each one represents a sports-related skill by the group of items presented above, and the collection of all these abilities represents the whole LSSS (second order model), and ii) a bifactorial model in which the eight sports-related skills are represented by the sample items presented above and the collection of every item (43) in the scale also represents the whole LSSS (bifactorial).

Other studies also propose the study of a bifactorial and second-order models, such as Cronin & Allen[26] and Myers et al.[38]. Models that contain over one order of effect prevent loadings between factors to be excessively high, because the higher-order dimension allow each loading to be interpreted as a low-order to higher-order loading. Instead, in bifactorial models, loading between factors are forced to zero and the items are allowed to show higher loadings between factors (for a deeper discussion on psychometric differences between these models in sports psychology, see Ntoumanis et al.[39]).

To evaluate the fit of these two models to the factors behind our data, we used common psychometric indicators, following Cronin & Allen [26]. Table 1 shows the benchmark indicators we use as a reference, where the second column gives a brief description, and the third column presents the literature suggested range for evaluation.

Table 1. Psychometric indicators for LSSS analysis.

Indicator	Description	Evaluation Range
Chi^2/df	The traditional chi-square test of fit is artificially inflated in models fitting large data and complex relations, so dividing it by the degree of freedom level gives a more appropriate indicator	< 3.0, adequate
RMSEA	An absolute level indicator, measures the square root of the sum of mean square error (approximately), that shows the error when comparing predicted values with real data	< 0.008, reasonable < 0.05, good fit
CFI	A relative indicator, measures mismatch between the model and data adjusting for size of the sample	> 0.90 acceptable > 0.95 excellent
TLI	A relative indicator, measures mismatch between the proposed model and a null model, adjusting by a negative bias in the mismatch	> 0.90 acceptable > 0.95 excellent
Cronbach Alpha	Internal consistency among subdimensions	> 0.70 adequate validity

Chi^2/df: chi-square statistic divided by degrees of freedom; RMSEA: root mean square error of approximation; CFI: comparative fit index; TLI: Tucker-Lewis index. Source: based on Cronin and Allen[26].

Initial Exploratory Analysis

An exploratory factor analysis was first run to check whether the eight expected factor were seen in the data. Contrasting information between the Cattell scree plot criterion and Horn parallel analysis, they both suggest that eight factors is the best possible fit over randomness in a normal distribution (the difference between factor and parallel analysis is lowered in the 8th factor). However, Kaiser method and Velicer minimum average partial method suggest lower number of factors: four and three respectively. Using eight factors explain over 99% of variance, and the Kaiser-Meyer-Olkin indicator was 0.988. Using regular correlations and polychoric correlations the conclusions are the same (because debate is held about using regular correlations in Likert scales in low-level categories and no normality, we compared both methods, reaching similar conclusions). The discrepancy between methods allows us to expect that using eight factors is adequate, though some of them will present lower loadings in general. Estimating the exploratory factor analysis we conclude that the first five factors show higher loadings than the last three, which is expected when the exploratory factor analysis shows this kind of results[44–46].

Results

Results show that both models proposed fit adequately to the data presented. Nevertheless, the bifactorial model shows a better fit than the second-order one, and it relates better to the data according to the following indicators: root mean square error of approximation (RMSEA), the comparative fit index (CFI), and the Tucker-Lewis index (TLI) (see Table 2).

Table 2. Comparison of psychometric properties between robust fitting of models.

Model	Chi^2	gl	Chi^2/gl	RMSEA	CFI	TLI
Bifactorial	3127.515***	808	3.87	0.048	0.93	0.92
Second-order	3468.867***	843	4.11	0.050	0.92	0.91

Chi^2: chi-square; gl: degrees of freedom; RMSEA: root mean square error of approximation; CFI: comparative fit index; TLI: Tucker-Lewis index. *p*-values references *** $p < 0.01$.

Psychometric properties of the scale aim to an adequate fit to the data. Internal consistency is high (Cronbach Alpha of 0.980) and item-total correlation (0.630). The exploratory analysis (see Table 3) converges to the use of eight factors, showing that some of them would load higher than others, which is also similar to the findings in previous uses of this scale[18,26].

Table 3. Comparison between bifactorial model and second-order model for every item and subdimension.

| Subdimension | Item | Bifactorial | | | | Second order | | | |
		General	p	Specific	p	Level 1	p	Level 2	p
TW	LSSS_1	0.83	***	0.31	***	0.89	***		
	LSSS_2	0.84	***	0.20	***	0.87	***		
	LSSS_3	0.69	***	-0.04		0.66	***		
	LSSS_4	0.80	***	0.45	***	0.88	***	0.95	***
	LSSS_5	0.83	***	0.30	***	0.88	***		
	LSSS_6	0.79	***	0.05		0.78	***		
	LSSS_7	0.79	***	0.33	***	0.85	***		
GS	LSSS_8	0.67	***	0.50	***	0.84	***		
	LSSS_9	0.60	***	0.52	***	0.79	***		
	LSSS_10	0.64	***	0.54	***	0.83	***		
	LSSS_11	0.61	***	0.52	***	0.81	***	0.77	***
	LSSS_12	0.64	***	0.54	***	0.84	***		
	LSSS_13	0.66	***	0.51	***	0.84	***		
	LSSS_14	0.66	***	0.55	***	0.86	***		
SS	LSSS_15	0.69	***	0.36	***	0.72	**		
	LSSS_16	0.81	***	0.29	***	0.84	**		
	LSSS_17	0.77	***	-0.08	**	0.76	**	0.98	***
	LSSS_18	0.79	***	0.14	**	0.81	**		
	LSSS_19	0.76	***	0.22	***	0.79	**		
PS	LSSS_20	0.67	***	0.34	**	0.76	**		
	LSSS_21	0.79	***	0.35	***	0.87	**		
	LSSS_22	0.75	***	0.40	***	0.85	**	0.89	***
	LSSS_23	0.76	***	0.46	***	0.87	**		
ES	LSSS_24	0.65	***	0.46	***	0.81	***		
	LSSS_25	0.64	***	0.49	***	0.80	***		
	LSSS_26	0.58	***	0.35	***	0.68	**	0.81	***
	LSSS_27	0.61	***	0.52	***	0.79	***		
LD	LSSS_28	0.86	***	0.08		0.86	***		
	LSSS_29	0.80	***	-0.10		0.81	***		
	LSSS_30	0.81	***	0.03		0.81	***		
	LSSS_31	0.83	***	0.01		0.82	***	0.99	***
	LSSS_32	0.81	***	-0.56		0.81	***		
	LSSS_33	0.74	***	0.12		0.74	***		
	LSSS_34	0.80	***	0.00		0.81	***		
	LSSS_35	0.70	***	-0.11		0.70	***		
TM	LSSS_36	0.59	***	0.63	***	0.86			
	LSSS_37	0.59	***	0.48	***	0.77		0.72	**
	LSSS_38	0.57	***	0.66	***	0.85			
	LSSS_39	0.65	***	0.53	***	0.85			
IC	LSSS_40	0.78	***	0.34	*	0.82			
	LSSS_41	0.76	***	0.14	***	0.78		0.97	
	LSSS_42	0.70	***	0.13	*	0.72			
	LSSS_43	0.84	***	0.21	**	0.87			

TW: teamwork; GS: goal-seeking; SS: social skills; PS: problem solving; ES: emotional skills; LD: leadership; TM: time management; IC: interpersonal communication; LSSS: Life Skills Scale For Sport; *p*-values references*:* * p < 0.1; ** p < 0.05; *** p < 0.01.

Discussion

The aim of this study was to translate and validate into Spanish the LSSS designed and validated by Cronin and Allen[26]. Firstly, the translated terms were consistent across evaluators and no relevant discrepancies were found. Secondly, we used a sample of 1251 Spanish-speaking sports practitioners between ages 15 and 29. Results show that both models proposed fit adequately to the data presented. Nevertheless, the bifactorial model shows a better fit than the second-order one, and it relates better to the data according to RMSEA, CFI and TLI indicators. These results give evidence that LSSS should be considered as a whole dimension, identified by all 43 items, instead of being only a collection of eight subdimensions. In other words, is better to consider LSSS as a general factor rather than it being influenced indirectly by the eight subdimensions. In future research, LSSS are to be considered as a factor itself.

Regarding the psychometric properties of the scale, this has an adequate fit and a high internal consistency, showing similar numbers as English[26] and Portuguese[43] version of the scale. Bifactorial model shows that the fit of the general factor is high and stable among all items. However, factor loading of specific item tends to be lower than the general model. For example, items three and six of teamwork show low loadings (which is also similar to the findings of Nascimiento-Junior et al.[18]. These authors show similar low and non-significant loadings for half of the leadership dimension (items five, six, seven and eight), while our findings shows that all its items' loadings are low and non-significant. Cronin & Allen[26] shows that leadership dimension general loading is the second lowest after emotional skills dimension. The bifactorial model shows higher loadings for the interpersonal communication dimension, whereas using the second-order model shows low and non-significant items and general loading. Nevertheless, the general fit of the bifactorial model suggests that the whole scale should be used and no subdimension should be excluded. Likewise, the use of the bifactorial model is more robust in "communication" subdimension inclusion, when using the bifactorial model, the overall load allows the subdimension to be included in the measurement; on the other hand, in the second-order model, neither the specific loads of the item nor the effect of the subdimension allow a good fit.

According to the evaluation of psychometric properties of the LSSS applied in Spanish speakers' population, the LSSS reproduces results collected in the publication of the original scale and maintains all the dimensions and the different elements-items that compose them. As several authors have said[47–49], it is essential to evaluate interventions and programs that have an impact on young people lives.

Having this instrument would give the opportunity to sports educators, coaches, and teachers in the area of physical education to measure the levels of these skills in their athletes and/or sports students. Also, it can be a complement for other scales that allow us to understand the sport atmosphere in a globality way such as Teaching Personal and Social Responsibility scale[47], Self Determination Scale[50], and the transfer of the LS in coaches, such as Coaching Life Skills in Sports Questionnaire for Coaches[49] or Life Skills Self-Assessment Tool for Coaches[51]. In addition, it provides an evaluation tool for researchers in the field, which will allow a) to improve the research and evaluation of the effectiveness of programs or interventions that aim at the development of LS in sport, and b) explore new theoretical frameworks that involve such skills.

Unlike the Portuguese instrument and the original instrument, the scale was applied to a larger sample, including more than 20 sports, such as football, canoeing, chess, climbing, bicycle, futsal, badminton, weightlifting, volleyball, boxing, kickboxing, handball, paddle tennis, among other disciplines. This diversity gives a window to expand the field of application of the instrument, bringing more opportunities for assessing LS.

Limitations and Strengths

As main limitations of this study, we found the type of sampling (non-probabilistic by convenience) and the lack of balance in terms of sex (59% are women). The applicability efficacy of this instrument in other age ranges and various socio-sports contexts should be evaluated in the future. However, once the psychometric properties of this scale translated into Spanish have been analyzed and according to the results, despite the limitations indicated above, we can say that the strength of this study is that the LSSS it is a useful scale to evaluate the levels of LS in contexts of physical activity and sport in the Spanish-speaking population aged between 15 and 29 years of age.

Conclusions

The LSSS, whose translation and validation into Spanish is addressed in this study, has shown to have adequate psychometric properties and is a valid instrument for the evaluation of LS in contexts of physical activity and sport with a young population of 15 to 29 years. This instrument facilitates Spanish-speaking experts and researchers belonging to the field of physical activity and sport to generate knowledge and scientific production.

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Conflict of interest

The authors declare no conflict of interest.