Cultural heritage education for high school students in Colombia: A socially appropriate measurement scale

Jacob Vargas-Arteaga, Marbel Gravini-Donado, Myriam Ortíz-Padilla
Simón Bolívar University, Colombia
Luz Elena Vargas-Ortiz
University of Cartagena, Colombia

The social appreciation of cultural heritage is a process where knowledge, values and relationships that people develop around their heritage assets converge. In the absence of validated instruments to measure this construct, this study has focused on designing and validating a *Measurement Scale for the Social Appreciation of Cultural Heritage* (MS-SACH) for high school students. The questionnaire's content has been approved by nine experts and applied to a pilot sample to assess its comprehension. For construct validation, the questionnaire was applied to a sample of 304 students. The confirmatory factor analysis allowed the retention of ten items grouped into three factors associated with the social appreciation of cultural heritage: (1) knowledge about cultural heritage; (2) values attributable to cultural heritage; and (3) heritage linkages. The results allow us to conclude that the scale developed presents evidence of validity and reliability, whose contribution can be of great value in studies for the evaluation of proposals related to the teaching of cultural heritage.

Introduction

Seen from a social perspective, cultural heritage is conceived as a dialogic and dynamic cultural construction by those who seek to recognise and promote it (Ballart & Tresserras, 2005). Therefore, cultural heritage has been recognised as the property of social groups by giving it a symbolic meaning, presenting it as an asset that can be enjoyed and transmitted to the following generations. Thus, when people reaffirm their belonging to social groups, they coincide in cultural meanings and values about heritage assets, giving rise to interactions that help build their identity.

Some approaches consider *Social Appropriation of Cultural Heritage* (ASPC in Spanish) as a tool for economic development based on the sustainable use of heritage assets (MinCultura, 2010). However, in this reporting of our current study, the term "appropriation" is replaced by "appreciation", to place an emphasis upon high valuing by social groups of their heritage assets and cultural practices. Such recognition of heritage consolidates it as a pillar of memory and support for personal identities, granting individuals a role in improving life's quality through their heritage enhancement, enjoyment and positive instrumentalisation, guaranteeing heritage protection, communication and sustainability over time (Querejazu, 2003; Vargas-Arteaga & Zanello-Riva, 2021).

Therefore, it is said heritage is relative to the culture that signifies it and to the environment where it is contextualised (Gómez-Redondo et al., 2016). The processes of heritage appreciation consider the knowledge, meanings and values that sustain heritage

assets, as well as the relationships that develop around them. Hence, these factors determine the way in which we select and value heritage elements. In addition, heritage appreciation contributes to the sense of belonging and construction of identity developments as part of a social group (Conde & Armas, 2019).

A search for studies related to cultural heritage reveals a number of studies that focus on heritage education (Ibáñez-Etxeberría et al., 2018; Montanares et al., 2018). Topics include the evaluation of standards and educational programs for heritage education (Calaf et al., 2020; Fontal-Merillas & Gómez-Redondo, 2015; Fontal & García, 2019); heritage education and patrimonialisation (Castro-Calviño et al., 2020a; Castro-Calviño et al., 2020b; Fontal-Merillas & Gómez-Redondo, 2015; Gómez-Redondo et al., 2016), and the relationships that people develop with their heritage (Ortega & Fontal Merillas, 2019; Fontal-Merillas & Marín-Cepeda, 2018; Marín-Cepeda, 2020; Marín-Cepeda & Fontal-Merillas, 2020; Martínez-Solís & Chaín-Navarro, 2018; Quijano-Araníbar, 2018). Studies that approach the subject of cultural heritage from social representations are also available (Conde & Armas, 2019; Malavassi Aguilar, 2017; Vargas-Arteaga et al., 2023). These studies addressed from qualitative approaches the processes of recognition, conservation and social appreciation of heritage. However, there is an absence of studies that offer validated instruments and indicators associated with social appreciation of cultural heritage, that would enable objective evaluation from this perspective.

Based on the above, the objective of our study is to design and validate an instrument with English language name *Measurement Scale for Social Appreciation of Cultural Heritage* (MS-SACH). For that reason, we started with the validation of content by experts, then explored the factorial structure of the questionnaire, and finally we analysed the psychometric properties of the scale based on the factorial model confirmation.

This research can offer valuable indications for the application of instruments to evaluate the effectiveness of didactic strategies designed to encourage knowledge, preservation and appreciation of cultural heritage. Our study may also be a starting point for further research, or integrated projects aimed at investigating the educational value of heritage assets.

Method

This is an instrumental study that seeks to determine the validity of a scale through a psychometric analysis (Montero & León, 2007) which is approached from a non-experimental, cross-sectional quantitative methodology (Ato et al., 2013).

Participants

Our study engaged three groups of participants: the first for content validation, a second for the pilot test to determine the instrument's comprehensibility and a third group for the exploratory and confirmatory factor analysis.

On content validation, nine professionals with doctoral degrees and research experience participated, comprising five women (56%) and four men (44%), sourced from six universities in Colombia and three in Mexico. Thirty-two secondary school students participated in the pilot study to evaluate the comprehensibility of the questionnaire; 62.5% males, 37.5% females, age range between 14 and 17 years of age (mean 15.4, standard deviation 1.13).

Regarding the sample size in the exploratory and confirmatory analyses, a recommendation to use a size greater than 200 cases was adopted (Ferrando & Anguiano-Carrasco, 2010; Lloret-Segura et al., 2014; Oros et al., 2020). Therefore, 304 students of high school from four urban educational institutions from a city located in the northern coast of Colombia participated in the factor analysis. From this group, approximately 25% of the sample was used in the exploratory study (n=81; 56.8% female; mean age 15.0, standard deviation 1.06); the remaining 75% was used in the confirmation of the factorial model (n=223; 52.5% female; mean age 14.98; standard deviation 1.10).

All groups of participants were purposively selected through non-probability sampling (Cohen & Manion, 2002; Hibberts et al., 2012). All subjects agreed to participate voluntarily and signed an informed consent form explaining the purpose of the study, the confidential treatment of personal data and the academic purpose of the information collected.

Procedure

Design and content validation for the MS-SACH scale
Three phases were considered in the design and subsequent validation of the MS-SACH instrument:

(a) Initially, based on a literature review, the construct *Social Appreciation of Cultural Heritage (SACH)* was conceptually defined from the theoretical contributions of some authors who have addressed issues related to the processes of heritage education, heritage management and patrimonialisation (Ballart Hernández et al., 1996; Ballart Hernández & Tresserras, 2005; Gómez-Redondo, 2013; González Monfort, 2007; Marín-Cepeda & Fontal, 2020; Potenzoni & Giudici, 2008; Querejazu, 2003; Vargas-Arteaga & Zanello-Riva, 2021). In the design of the scale items, the theoretical representativeness of each item was taken into account and the indicators and scale items were defined in such a way that they theoretically represented the construct to be measured. Thus, the variable was operationalised into 13 indicators associated with 18 items that were written as statements with response options on a five point Likert scale: Strongly disagree=1, Disagree=2, Neither agree nor disagree=3, Agree=4, Strongly agree=5. The questionnaire was divided into two blocks: the first block included 7 items that inquired about sociodemographic information; and in the second block, the items associated with the preliminary indicators of the *SACH* variable.

(b) In the second phase, the content of the instrument was reviewed to verify the adequacy of the items with the variable to be measured (Cohen & Swerdlik, 2001). The first version of the instrument was reviewed by the nine experts, who evaluated each of the proposed items in four aspects: Sufficiency, Clarity, Coherence and Relevance (Escobar-Pérez & Cuervo-Martínez, 2008). To determine the selection of items for second version from the instrument, the index of agreement among experts was considered (Bernal-García et al., 2020) and the Fleiss kappa coefficient (Landis & Koch, 1977). The experts filled out the validation record and included, in addition to the item scores, qualitative observations in relation to the aspects to be improved in terms of the wording from the instrument. In order to determine the selection of the items on a second version of the instrument, the Aiken V coefficient was considered (Aiken, 1980). The data from the expert evaluation template were organised in a Microsoft *Excel* 2016 sheet and analysed in *SPSS* software version 27.

(c) Next, when applying the pilot test to a group of students, items with a comprehensibility of less than 80% were evidenced, being a low level according to the scale proposed by Bernal-García et al., (2020). Some changes were made in the wording of items so that the language used on statements would be clearer and more understandable for students. Subsequently, a second pilot was applied, where a percentage of comprehensibility higher than 85% was obtained in the 14 items of the second version from the instrument. In terms of reliability, Cronbach's alpha was obtained with a value of .71, obtaining an acceptable internal consistency for this version of the scale (Oviedo & Campo-Arias, 2005). The data from the expert evaluation template were organized in a Microsoft *Excel* 2016 sheet and analysed in *SPSS* statistics software version 27.

Psychometric analysis of the MS-SACH scale

Exploratory factor analysis (EFA) gathers items of an instrument according to the correlations towards certain dimensions based on the linear associations between the observed variables (Martinez Ávila, 2021; Méndez & Rondon, 2012) generating latent variables called factors that group the questionnaire items together (Turrado-Sevilla & Cantón-Mayo, 2022). This type of analysis is characterised by offering greater flexibility in the definition of the factors that make up the structure of the instrument (Ballesteros Velázquez et al., 2019). Initially, to determine the underlying dimensions of the second version of the MS-SACH scale, the instrument was applied to 81 students whose data were organised in a matrix to be analysed in the program *Factor Analysis* version 12.03.01 (Ferrando & Lorenzo-Seva, 2017). To check the adequacy of the data, Barlett's test of sphericity was taken into account (Bartlett, 1951) and Kaiser-Meyer-Oklin's KMO index which is considered acceptable when the value obtained is greater than .70 (Beavers et al., 2013). The estimation of the EFA was carried out considering the polychoric correlation matrix and using the principal component extraction method with varimax rotation. Items with sufficient representativeness in the emerging dimensions and significant values greater than .30 were retained (Gravini-Donado et al., 2021; Landa Cavazos & Ramírez Sánchez, 2018). Factors were identified as having eigenvalues greater than 1, with an adequate item-factor theoretical correspondence and having at least three items (García et al., 2022; Lloret-Segura et al., 2014; Oros et al., 2020).

After obtaining adequate values in the exploratory analysis study, we proceeded to confirm the internal structure of the emerging model through a confirmatory factor analysis (CFA) based on structural equation modeling in the *AMOS* version 24 program. To determine the fit of the model, the criteria proposed in the literature were considered (Cartagena Beteta et al., 2022; Hair et al., 2006; Hu & Bentler, 1999; Keith, 2019) by considering values greater than .90 for the Tucker-Lewis Index (TLI), comparative fit index (CFI), incremental fit index (IFI), normed fit index (NFI) and a value less than .08 for the root mean square error of approximation (RMSEA).

Finally, to determine the internal consistency in this phase of the study, Cronbach's alpha coefficient was considered. Additionally, the McDonald omega coefficient was obtained to consider the loadings presented by the items to each factor without depending on their characteristics (Ventura-León & Caycho-Rodríguez, 2017).

Results

Content validity of the MS-SACH scale

From the experts' evaluation of the first version of the instrument, the Fleiss kappa coefficient was obtained to determine the concordance between the evaluators on each of the items of the questionnaire. Table 1 shows the values obtained in the four criteria evaluated by the experts and their assessment according to the scale proposed by Landis and Koch (1977). It should be noted that in the four criteria there was considerable agreement among the judges, with the *Relevance* criterion obtaining the highest value in the coefficient (0.667).

Table 1: Fleiss Kappa coefficient of the criteria evaluated by the experts

Criteria	Fleiss Kappa coefficient	p-value	Valuation
Sufficiency	0.634	0.000	Substantial
Clarity	0.622	0.000	Substantial
Consistency	0.643	0.000	Substantial
Relevance	0.667	0.000	Substantial

Note: Valuation interpretation based on the original scale of Landis and Koch (1977).

In addition, the Aiken V coefficient was obtained (Aiken, 1980), following the method proposed by Penfield and Giacobbi (2004) to determine inter-rater agreement on each of the items of a questionnaire. This method is recommended to quantify the content validity of psychometric instruments with a high degree of reliability and objectivity (Escurra Mayaute, 1988). Table 2 shows the evaluation of the four criteria by the experts.

Table 2: Aiken's V coefficient in the criteria evaluated by the experts
M: Mean; SD: Standard deviation; V: Aiken's V; CI: 95% confidence interval.
(use web or PDF reader 'zoom in' function to read)

Item	Sufficiency				Clarity				Consistency				Relevance			
	M	SD	V	CI	M	SD	V	CI	M	SD	V	CI	M	SD	V	CI
1	2.89	0.31	**0.63**	0.46 - 0.77	3.11	0.31	**0.70**	0.53 - 0.83	3.11	0.31	**0.70**	0.53 - 0.83	2.67	0.47	**0.56**	0.39 - 0.71
2	3.89	0.31	0.96	0.84 - 0.99	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	3.89	0.31	0.96	0.84 - 0.99
3	2.78	0.42	**0.59**	0.42 - 0.74	3.00	0.00	**0.67**	0.50 - 0.80	3.22	0.42	**0.74**	0.57 - 0.86	2.78	0.42	**0.59**	0.42 - 0.74
4	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00
5	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00
6	3.33	0.67	0.78	0.61 - 0.89	3.89	0.31	0.96	0.84 - 0.99	3.56	0.50	0.85	0.69 - 0.94	3.11	0.74	**0.70**	0.53 - 0.83
7	3.44	0.50	0.81	0.65 - 0.91	3.89	0.31	0.96	0.84 - 0.99	4.00	0.00	1.00	0.90 - 1.00	3.33	0.47	0.78	0.61 - 0.89
8	3.89	0.31	0.96	0.84 - 0.99	4.00	0.00	1.00	0.90 - 1.00	3.89	0.31	0.96	0.84 - 0.99	4.00	0.00	1.00	0.90 - 1.00
9	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00
10	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00
11	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00
12	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00
13	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00
14	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00
15	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00
16	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00	4.00	0.00	1.00	0.90 - 1.00
17	2.89	0.57	**0.63**	0.46 - 0.77	3.44	0.50	0.81	0.65 - 0.91	4.00	0.00	1.00	0.90 - 1.00	3.11	0.31	**0.70**	0.53 - 0.83
18	3.00	0.00	**0.67**	0.50 - 0.80	3.67	0.47	0.89	0.74 - 0.96	4.00	0.00	1.00	0.90 - 1.00	3.11	0.31	**0.70**	0.53 - 0.83

The data in Table 2 show that for the *Sufficiency* criterion, the lowest scores that are highlighted are those obtained by item 1 (V=0.63), item 3 (V=0.59), item 17 (V=0.67) and item 18 (V=0.67). In the *Clarity* criterion, items 1 and 3 were the least representative with V values equal to 0.70 and 0.67 respectively. The items that presented low scores in the *Coherence* criterion were 1 (V=0.70) and 3 (V=0.74). Finally, in the *Relevance* criterion, items 1, 3, 6, 17 and 18 presented the lowest representativeness (V= 0.56; 0.59; 0.70; 0.70 and 0.70). The other items were located in each of the four criteria with a value above 0.75, which is the minimum suggested for the acceptance of the reagent (Penfield & Giacobbi, 2004).

In a complementary manner, the qualitative observations of the judges on these items were reviewed, so it was necessary to dispense with items 1 and 3, merging items 6 with item 7, 8 with item 13 and item 17 with item 18, thus seeking a greater theoretical correspondence with the indicator. The positive evaluation by the experts of the second version of the instrument which had 14 items shows the concordance between the items and the construct proposed at the theoretical level. Accordingly, validation was carried out through exploratory and confirmatory analysis.

Exploratory factor analysis of the MS-SACH scale

The preliminary analysis of the EFA carried out in the *Factor Analysis* program version 12.03.01 initially allowed 4 factors to be extracted. However, items 2 and 11 were eliminated as they presented low communalities, as well as item 3, which loaded on a single factor, while item 9 did not correspond at the theoretical level with the associated factor. Subsequently, a structure of three underlying factors was obtained with an explained variance of 66.75%.

The resulting model consists of 10 items that correspond theoretically to the resulting dimensions with communalities above 0.50 and with factor loadings above .40. The value of the determinant of the correlation matrix was 0.0156 close to zero, demonstrating a linear relationship between the observed variables. Table 3 shows the factors with each of their items already reorganised with their respective factor loadings.

Table 3: Reorganisation of the items according to the emerging factors

	Item	F1	F2	F3
1.	The cultural heritage of my locality allows me to know, interpret and understand the way of life, as well as the events that marked the history of my ancestors and of my locality.	0.657		
2.	I consider that the cultural heritage of my locality is an important part of the preservation of the collective memory of my locality.	0.695		
3.	I recognise that the heritage assets that exist in my locality allow us to preserve traditions and our cultural identity.	0.647		
4.	The promotion and dissemination of the cultural heritage of my locality can contribute to economic development and the improvement of the quality of life in my locality.	0.824		
5.	I consider that the heritage assets that exist in my environment represent and allow me to understand the history, cultural expressions and way of life of the ancestors of my locality.		0.866	
6.	When in contact with the heritage assets of my locality, I appreciate the characteristics that demonstrate their beauty, artistic quality and their contributions to cultural development.		0.425	
7.	The murals, paintings, sculptures and other material goods that are part of the heritage of my locality represent the artistic heritage of the region.		0.413	
8.	I feel identified with the goods, customs, traditions and other cultural manifestations that represent the heritage of my locality.			0.827
9.	The heritage assets and cultural manifestations that exist in my locality make me feel proud to belong to this community.			0.731
10.	The emblematic places, heritage assets and cultural manifestations of my locality allow me to remember past events or experiences of my life or my community.			0.822
Note: F1: Knowledge about cultural heritage; F2: Values attributable to cultural heritage; F3: Heritage linkages.				

Likewise, the correlation between items presented a KMO=0.844, being a remarkably satisfactory value (Beavers et al., 2013; Lloret-Segura et al., 2014). The adequacy of the data to perform the AFE was confirmed by obtaining a significant value in the Barlett's test of sphericity (χ^2 = 319.5; df = 45; p = 0.000010). The internal consistency analysis yielded satisfactory values for the three factors (F1: 0.80; F2: 0.60; F3: 0.83) and a total reliability value of 0.90 for the entire scale.

According to the theoretical review and after the reorganisation of the items in the factorial structure, the emerging dimensions or factors were denominated as follows: F1. Knowledge about cultural heritage; F2. Values attributable to cultural heritage and F3. Heritage linkages.

Confirmatory factor analysis of the MS-SACH scale

Based on the results of the AFE, the three-factor model was tested with 10 items, obtaining a good fit in the RMSEA index. However, the value presented by the NFI index was below the .90 threshold, so it was necessary to respecify the initial model by correlating the errors of the items suggested by the modification index in the *AMOS* program (items 1 and 2; items 1 and 4). Table 4 shows that in the second model the indexes present a good fit, since values above .90 were obtained and the RMSEA was well below .05.

Table 4: Model fit index

Model	χ^2/gl	IFC	TLI	IFI	NFI	RMSEA
Original model	1.53	.952	.933	.954	.878	.049
Respecified model	1.17	.985	.978	.986	.912	.028

Figure 1 presents the final three-factor model. A high correlation is observed between the latent variables F1 and F2 (.97) and the lowest between factors F1 and F3 (.82). The loadings of all items with respect to their factor were greater than .30.

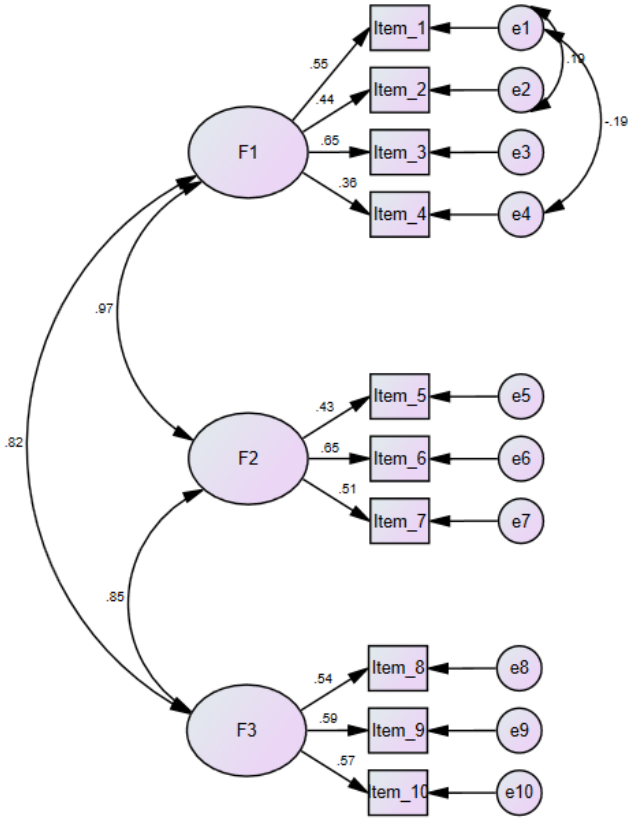

Figure 1: Confirmatory factor model of the MS-SACH scale

Finally, in the estimation of Cronbach's alpha, a value of .769 was obtained. Similarly, due to the existence of correlated errors, the McDonald omega coefficient was obtained, with a value of .805 for the entire scale.

Discussion

The objective of this study was to demonstrate evidence associated with the content validity, factorial structure and reliability of the MS-SACH scale applied to elementary school students. Since there are no previous studies that evaluate this construct, the findings reveal that the scale should be interpreted as a three-factor measure, which constitutes the greatest scientific value of this research by offering a measure to evaluate SACH.

In the content evaluation process, the Fleiss kappa coefficient and the Aiken V coefficient were obtained after considering the observations by each of the experts. The second version of the instrument was reduced to 14 items, taking into account the criteria of theoretical correspondence with the indicators initially proposed, so that together they would represent the construct being measured (Escobar-Pérez & Cuervo-Martínez, 2008). However, the results of the EFA indicate that only ten of the fourteen items initially proposed would make up the final scale. Some items were eliminated based on criteria related to item-factor theoretical concordance and psychometric optimisation of the model.

The ten definitive items formed a three-factor structure related to the construct under study, which was confirmed with the CFA. The emerging factors in the model were denominated in accordance with the theoretical foundations of the study as follows: Factor 1. Knowledge about cultural heritage; Factor 2. Values attributable to cultural heritage; and Factor 3. Heritage linkages.

In Factor 1 named *Knowledge about cultural heritage*, items 1, 2, 3 and 4 are grouped, being related to fundamental theoretical elements underlying the SACH, since in order to achieve it, it is necessary for people to acquire knowledge about the heritage property to then internalise it, interpret it, endow it with meanings, generating relationships with it from the individual to the collective based on the similarities and the nature of their memory, history and identity. It is reaffirmed then that heritage is relative to the culture that signifies and contextualises it (Gómez-Redondo et al., 2016), giving rise to the construction of collective identities (Gómez-Redondo, 2013). Similarly, this factor considers the enhancement of heritage, which offers development opportunities for social groups as a fundamental basis for improving their quality of life (PNUD, 1990; Sen, 1999).

As for Factor 2, *Values attributable to cultural heritage*, items 5, 6 and 7 are associated, being focused on aspects related to the historical value, the aesthetic value and the artistic value of heritage properties (Acevedo, 2014; Fontal-Merillas, 2003). These dimensions are part of the subjective component that determines the values attributable to heritage, since it is the people who provide certain attributes or qualities to heritage properties (Ballart

Hernández et al., 1996). Therefore, cultural heritage reflects the identity and expresses the culture of the social group that gives these values to those elements that tell its history. In this regard, Bustos Cara (2004) pointed out that the appreciation of heritage incorporates the values that are socially constructed to express the actions that result in the identity and preservation of the cultural legacy of social groups, which are responsible for valuing and positioning it as a key tool in the construction of historical knowledge (González Monfort, 2007).

Factor 3, *Heritage linkages* presents items 8, 9 and 10 that are associated with the relationships that people can establish with heritage assets, which are supported by the meanings and attitudes associated with identity, belonging and affectivity (Gómez-Redondo, 2013; Marín-Cepeda & Fontal-Merillas, 2020). These constructions of meanings called patrimonial ties support the identity and culture of social groups, therefore they can be categorised as bridges between people and their context (Fontal-Merillas & Marín-Cepeda, 2018) which can be explained from the relational perspective of heritage (Fontal-Merillas, 2013), conceived as a web of material or symbolic relationships between individuals and heritage assets.

In summary, the validation process developed in this study shows that the MS-SACH scale offers three factors with ten items to measure the social appreciation of heritage with a high degree of reliability, which is evident in the results of the EFA and CFA, as well as in the internal consistency analysis. It is shown that the definitive items are relevant, and representative of the construct studied and that the scale is appropriate for application to high school students.

Conclusion

One of the main challenges when designing instruments for the measurement of constructs is to develop empirical processes that guarantee their validity and reliability (Montero-Rojas, 2008). Our study began with a theoretical review that led to the definition of the SACH variable, which was initially operationalised in thirteen indicators with eighteen items. In the content validation phase, a favourable evaluation was obtained which led to the application of the exploratory and confirmatory analyses, the results of which determined the restructuring of the scale into ten items grouped into three factors.

The findings of this study present the first psychometric indications of validity and internal consistency of the MS-SACH scale, whose contributions can serve as a basis for the measurement of the construct studied in the context of the heritage towns of Colombia, and in those countries where it is necessary to investigate the knowledge, values and links that people have in relation to their heritage assets. It is convenient to continue investigating the validity of the scale in larger samples and similar contexts, since one of the limitations of this study has been the size of the sample due to the limited availability of the subjects. However, even if small samples are used for various reasons, these studies offer reliable instruments whose validity is based on the scientific rigour with which they have been developed (Aguilar-Esteva et al., 2021; Cancino-Santizo et al., 2023; Gómez-del-Pulgar et al., 2022).

Finally, the scale presented represents highly useful instrument for those studies that address the teaching of cultural heritage, specifically in research that has sought to measure the effectiveness of didactic interventions aimed at the knowledge and social appreciation of cultural heritage in educational scenarios (Vargas-Arteaga, 2023). Although the findings presented here are the product of a study conducted entirely in Spanish, it is hoped that the MS-SACH scale can be applied in different languages, especially in contexts where it is necessary to develop strategies to strengthen identity and appreciation for the cultural heritage manifestations of social groups.

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Appendix 1: Initial items of the MS-SACH Scale

Dimension	Item	Statement
Recognition of patrimonial assets	1.	I know the assets declared heritage in my locality, such as: emblematic places, architectural works, murals, sculptures, archaeological elements, etc.
	2.	I feel capable of showing and explaining to visitors the past events related to the heritage assets of my town.
Memory	3.	It is easy for me to remember the traditions and cultural expressions associated with festivities, typical dances, gastronomy, ancestral knowledge, and handicraft techniques that exist in my locality.
	4.	When I visit places, monuments and heritage assets that exist in my locality I can remember previous generations or events that happened in the past.
	5.	I consider that the cultural heritage of my locality is an important part of the preservation of the collective memory of my locality.
Recognition of cultural identity	6.	I recognise that the heritage assets that exist in my locality allow us to preserve our traditions and cultural identity.
	7.	I believe that by knowing and disseminating the heritage of my locality I can contribute to the strengthening of my cultural identity.
Historical value	8.	I recognise that the heritage assets that exist in my environment represent and allow me to understand historical facts and the cultural legacy and way of life of my ancestors.
Aesthetic value	9.	When in contact with heritage properties, their physical characteristics or attributes that reflect their beauty, artistic quality and their contribution to cultural development.
Artistic value	10.	The murals, paintings, sculptures and other material goods that are part of the heritage of my locality represent the artistic legacy that allow us to recognise our region.
Educational value	11.	The study of cultural heritage allows us to know the past and to understand the implications of our actions to preserve it in the present with respect to our future.
Heritage as a development factor	12.	The enhancement and promotion of the cultural heritage of my locality can become an instrument for economic development and the improvement of the quality of life in my locality.
Meanings	13.	The cultural heritage of my locality allows me to know, interpret and understand the way of life as well as the events that marked the history of my ancestors.
	14.	The heritage assets existing in my locality allow me to communicate and make known essential elements of my culture.
Individual link	15.	I feel identified with the goods, customs, traditions and other cultural manifestations that represent the heritage of my locality.
Social link	16.	I am excited to visit or discover heritage assets in my locality, which makes me feel proud to belong to this community.
Temporary link	17.	The heritage assets and cultural manifestations of my locality allow me to remember past events or experiences of my life or my community.
Spatial link	18.	I can associate emblematic places and heritage assets of my territory with special moments in my life.

Appendix 2: Final items of the MS-SACH Scale

The versions of the scale are available under Creative Commons Licenses. The Spanish version of the MS-SACH Scale is at https://bit.ly/48uQHj6 [https://drive.google.com/file/d/11baQOWY18DBIfCPuR4JhzeKKry8emeoR/view]

Response options:
1=Strongly disagree; 2=Disagree; 3=Neither agree nor disagree; 4=Agree; 5=Strongly agree.

No.	Item statement	Response options				
		1	2	3	4	5
1.	The cultural heritage of my locality allows me to know, interpret and understand the way of life, as well as the events that marked the history of my ancestors and of my locality.					
2.	I consider that the cultural heritage of my locality is an important part of the preservation of the collective memory of my locality.					
3.	I recognise that the heritage assets that exist in my locality allow us to preserve traditions and our cultural identity.					
4.	The promotion and dissemination of the cultural heritage of my locality can contribute to economic development and the improvement of the quality of life in my locality.					
5.	I consider that the heritage assets that exist in my environment represent and allow me to understand the history, cultural expressions and way of life of the ancestors of my locality.					
6.	When in contact with the heritage assets of my locality, I appreciate the characteristics that demonstrate their beauty, artistic quality and their contributions to cultural development.					
7.	The murals, paintings, sculptures and other material goods that are part of the heritage of my locality represent the artistic heritage of the region.					
8.	I feel identified with the goods, customs, traditions and other cultural manifestations that represent the heritage of my locality.					
9.	The heritage assets and cultural manifestations that exist in my locality make me feel proud to belong to this community.					
10.	The emblematic places, heritage assets and cultural manifestations of my locality allow me to remember past events or experiences of my life or my community.					

Dr Jacob Vargas-Arteaga (corresponding author), Simón Bolívar University, Colombia, holds a degree in Computer Science and Audiovisual Media and a Masters in Education degree from the University of Cordóba, Colombia. His doctorate in Educational Sciences was attained at Simón Bolívar University, Colombia. He is a teacher of computer technology and member of the research group Cymted-L recognised by the Ministry of Science and Technology of Colombia.
ORCID: https://orcid.org/0000-0003-3712-4907
Email: jacob.vargas@unisimon.edu.co

Dr Marbel Gravini-Donado holds a degree in psychology from Universidad Metropolitana de Barranquilla, a Masters in Education from Fundación Universidad del Norte, Colombia, and a doctorate in Education from Universidad Autónoma de Madrid, Spain. Dr Gravini-Donado is a professor and researcher at Simón Bolívar University, Colombia, and is recognised as a Senior Researcher by the Ministry of Science and Technology of Colombia.
ORCID: https://orcid.org/0000-0003-3972-5271
Email: mgravini1@unisimonbolivar.edu.co

Dr Myriam Ortíz-Padilla holds a degree in psychology from Universidad Metropolitana de Barranquilla, a Masters in Education from Fundación Universidad del Norte, Colombia, and a doctorate in education from Universidad Autónoma de Madrid, Spain. Dr Ortíz-Padilla is a teacher and researcher at Simón Bolívar University, Colombia, and is recognised as an Associate Researcher by the Ministry of Science and Technology of Colombia.
ORCID: https://orcid.org/0000-0001-8964-9428
Email: mortiz@unisimonbolivar.edu.co

Ms Luz Elena Vargas-Ortiz holds a degree in mathematics from the University of Cordoba, a Masters in Statistical Sciences from the National University of Colombia, and is currently a PhD candidate in Engineering at the University of Cartagena. Ms Vargas-Ortiz is a professor at the University of Cartagena, Colombia, and is recognised as a Junior Researcher by the Ministry of Science and Technology of Colombia.
ORCID: https://orcid.org/0000-0003-4716-5227
Email: lvargaso@unicartagena.edu.co

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