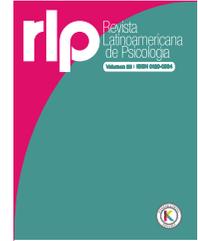# Revista Latinoamericana de Psicología

ORIGINAL

A brief parent version of the Spence Children's Anxiety Scale (SCAS-P-8): Factor structure, reliability, and invariance in Ecuadorian children

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Abstract Objective: The present study aimed to assess the psychometric properties and factor structure of the parent-reported brief version of the Spence Children's Anxiety Scale (SCAS-P-8) in a sample of Ecuadorian children. **Method:** The community sample consisted of 281 children from 8 to 12 years of age and their parents. Factor structure of the scale was assessed through confirmatory factor analysis. The psychometric properties and sex and age invariance were calculated. **Results:** The results showed that the one-factor structure of the SCAS-P-8 provided a good fit for the data, and that the structure was invariant across gender and age, indicating that it is suitable for assessing anxiety symptoms in both boys and girls of different ages with comparable accuracy. Psychometric analysis revealed a total ordinal alpha of .85, and corrected item-total correlations varied from .41 to .61, indicating an acceptable level of homogeneity. **Conclusion:** The study found that the SCAS-P-8 is a psychometrically reliable tool for measuring anxiety in Ecuadorian children from 8 to 12 years of age, as reported by their parents, and can be used in both research and clinical settings to evaluate anxiety symptoms in community populations in Ecuador. Given its brief and accurate nature, the SCAS-P-8 is considered to be a useful tool for use in both research and clinical settings for evaluating anxiety symptoms in children in this country.

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Validación de la versión para padres de la Escala de Ansiedad Infantil de Spence-Breve (SCAS-P-8) en niños ecuatorianos

Resumen Objetivo: Este artículo tiene por objetivo evaluar las propiedades psicométricas y la estructura factorial de la versión breve de la Escala de Ansiedad Infantil de Spence (SCAS-P-8) informada por los padres en una muestra de niños ecuatorianos. **Método:** La muestra comunitaria estuvo compuesta por 281 niños de entre 8 y 12 años y sus padres. La estructura factorial de la escala fue evaluada mediante análisis factorial confirmatorio. Se calcularon las propiedades psicométricas y la invarianza en función del género y la edad. **Resultados:** Los resultados mostraron que la estructura unifactorial de la escala proporcionó un buen ajuste para los datos, y que esta fue invariante en cuanto al género y la edad. Esto indica que el SCAS-P-8 es una medida adecuada para evaluar los síntomas de ansiedad tanto en niños como en niñas de diferentes edades con una precisión comparable. El análisis psicométrico reveló un alfa ordinal total de .85, y las correlaciones corregidas ítem-total variaron de .41 a .61, indicando un nivel aceptable de homogeneidad. **Conclusión.** La escala SCAS-P-8 es una herramienta adecuada para medir la ansiedad en niños ecuatorianos de 8 a 12 años por medio de la información reportada por sus padres. Dada su naturaleza breve y precisa, el SCAS-P-8 se considera una herramienta útil para su uso tanto en investigaciones como en entornos clínicos para evaluar los síntomas de ansiedad en niños de Ecuador.

Among the most common mental disorders in childhood and adolescence are anxiety disorders, which may result in feelings of excessive worry and fear (World Health Organisation, 2021). According to the Institute of Health Metrics and Evaluation (2019), 58 million children and adolescents worldwide suffer from this mental health condition. Anxiety has a significant impact on children, their families, their relationships, and their school life (Mohammad et al., 2020). In Ecuador, the prevalence of anxiety disorder per 100 000 children between the ages of 4 and 18 in both sexes is 2 765 (Institute of Health Metrics and Evaluation, 2019).

Anxiety in childhood is not often detected and treated in time. Therefore, it tends to persist and become chronic (Creswell et al., 2020; Essau et al., 2014; Kara, 2022), being a precursor of other problems in adolescents and adults such as depression (Gundel et al., 2018; Kohn, 2018; Morales-Muñoz et al., 2023; Orgilés et al., 2020). One factor to be considered in the assessment of childhood anxiety disorders is the difficulty that children have in identifying and verbalising their own symptoms (Emslie, 2008). For this reason, it is necessary to obtain information from multiple informants, e.g., from parents, care givers, and teachers (Freidl et al., 2017; Spence, 2018). Based on previous research, it has been suggested that parents can provide valuable information to mental health professionals during the assessment process of young children, which can supplement self-reported measures (Hyland et al., 2022; Reardon et al., 2018; Vidair et al., 2011). Utilising various measures can further assist mental health professionals in obtaining comprehensive information to facilitate diagnosis and treatment planning (Reardon et al., 2019b).

To date, very few studies in the literature have validated anxiety assessment tests that include a parent-reported version, such as the SCARED-R (Muris et al., 1999), MASC 2 (March, 2012), or SCAS (Spence, 1997, 1998). In particular, the SCAS is one of the most widely used tools to assess anxiety in the child-adolescent population because it has shown excellent psychometric properties, and its brevity

facilitates its administration in different contexts (Orgilés et al., 2022). Furthermore, the SCAS has different versions depending on the age of the children evaluated, such as the preschool version (PAS; Spence et al., 2001), the informant (i.e., self-reported [SCAS-C; Reardon et al., 2019], parent-reported [SCAS-P; Nauta et al., 2004], and teacher-reported [Lyneham et al., 2008]). Short versions of the scale have also been developed (SCAS-S; Ahlen et al., 2018).

The original parent-reported version of the SCAS was composed of 38 items and maintains the same structure as the self-reported version (Nauta et al., 2004). It demonstrated excellent psychometric properties (Nauta et al., 2004), as supported by several studies (e.g., Arendt et al., 2014, Whiteside & Brown, 2008). Currently, the SCAS-P is used in different countries and has been translated and validated in studies with various community populations, (e.g., Arendt et al., 2014, DeSousa et al., 2014, Orgilés et al., 2019, Whiteside & Brown, 2008), where it has been shown to be sensitive in identifying children with high levels of anxiety (Reardon et al., 2018). A brief version of the instrument, the SCAS-P-8, was developed, adapted, and validated for the Spanish population in order to facilitate its application in specific contexts, such as in schools or primary care centres, supporting its usefulness in detecting child anxiety problems (Orgilés et al., 2022).

The SCAS-P has demonstrated good psychometric properties for Spanish parents. However, cultural differences and a lack of locally adapted instruments that measure clinical symptomatology in Latin American populations (Larzabal-Fernández et al., 2023) make it necessary to examine whether its psychometric properties are also good in other Spanish-speaking populations. Thus, to provide an evaluation instrument that facilitates the early detection of anxiety problems in Ecuadorian children, this study aimed to examine the psychometric properties and factorial structure of the SCAS-P-8 in a sample of Ecuadorian children from 8 to 12 years of age. Based on previous studies, we hypothesised

that the scale would show good reliability and a unifactorial structure.

Method

Participants

The sample consisted of 281 parents (86.10% mothers) of children from 8 to 12 years of age *(M* = 9.39; *SD* = 1.36*)*. Of the children, 127 (45.19%) were girls and 154 (54.80%) were boys. Table 1 presents the sociodemographic information regarding the school year, nationality, number of siblings, family situation, and parental socio-economic and educational level.

Measures

Brief version for parents of the Spence Children's Anxiety Scale (SCAS-P-8; Orgilés et al., 2022; Reardon et al., 2018). The SCAS-P-8 is an 8-item questionnaire designed to assess symptoms of social anxiety (2 items), separation anxiety (2 items), panic/agoraphobia (1 item), and generalised anxiety (3 items) based on the current DSM-5 criteria (APA, 2013; Reardon et al., 2018). Responses are rated on a 4-point Likert scale (0-*never*, 1-*sometimes*, 2-*often*, and 3-*always*), with total scores ranging from 0 to 24, where higher scores indicate higher levels of anxiety. The SCAS-P-8 achieved good psychometric properties, including a reasonable internal consistency (α = .82), and an optimal cut-off score for the parent report established at 7.5 (Reardon et al., 2018). The instrument has also demonstrated good psychometric properties in a Spanish-speaking sample (Orgilés et al., 2022), supporting a one-factor structure (Orgilés et al., 2022).

Procedure

The items of the Spanish version of the SCAS were reviewed by a native psychologist affiliated with a university in Ecuador to determine if any adaptations were needed to suit the cultural context. After confirming that no changes were necessary, the scale was piloted with five parents of children aged 8 to 12 to ensure that they understood the scale's items. Subsequently, an online questionnaire was distributed via social media platforms (Facebook, Twitter, and Instagram). Families were provided with information concerning the study and were invited to participate after providing informed consent. Data was collected from one parent only, and no incentives were offered for participation. The scale took approximately 7 minutes to complete. The study was approved by the Ethics Committee of the Miguel Hernández University of Elche (Ref. ADH.DES.MAIG.MAIG.23).

Statistical analysis

The data was analysed in several stages, according to the aims of the study. First, we conducted CFA within the framework of R 3.5.2 with RStudio 1.1.453 (Team, 2018) to test the unifactorial structure of the SCAS-P-8 (Orgilés et al., 2022; Reardon et al., 2018). In line with previous stud-ies, diagonally weighted least squares (DWLS) estimator was used because of its robustness with ordinal data (Forero et al., 2009). Multiple goodness-of-fit indicators were used, including CFI and TLI ≥ .95, RMSEA and SRMR ≤ .08 (Hu & Bentlet, 1999; MacCallum et al., 1996).

Second, the psychometric properties of the Ecuadorian version of the SCAS-P-8 were explored, including mean and standard deviation for each item, corrected item-total correlation, ordinal alpha if the item was removed, and ordinal alpha for the tool. Our decision for calculating ordinal alpha was determined by the fact that this is a more accurate estimator of reliability for ordinal response scales than the popular Cronbach's alpha (Gadermann et al., 2012). Based on Nunnally (1978), a criterion of $\alpha \geq .70$ to assess the adequacy of the alpha coefficient for research objectives was established. Composite reliability was assessed, which is not dependent on the number of attributes related to each concept, and an index of 0.70 or above is considered acceptable (Nunnally, 1978). Additionally, we estimated factor convergence using the average variance extracted (AVE) from the items. The higher the value of the AVE, the greater the representativeness of the indicators on the latent variable in which they saturate (Hair et al., 2006)

Third, to test the SCAS-P-8 invariance over children's sex ("male" and "female") and age ("from 8 to 9 years old" and "from 10 to 12 years old"), Multiple Group Confirmatory Factor Analysis (MG-CFA) was performed in the framework of R 3.5.2 with RStudio 1.1.453 (Team, 2018). Following the recommendations registered in the literature (Cheung, & Rensvold, 2002; Kimber et al., 2015; Timmons, 2010), evidence of invariance was provided by comparing less restrictive models (e.g., configural invariance) and more restrictive models (e.g., weak invariance). A value of change in CFI (ΔCFI) and TLI (ΔTLI) smaller or equal to 0.01, and a ΔRMSEA value smaller or equal to 0.015 were indicators of invariance across groups. Lastly, the characteristics of the sample and the differences by age and sex in the SCAS-P-8 were studied using descriptive statistics by way of the SPSS v26 programme.

Results

Structural validity

CFA results indicated that the one-factor model yielded an adequate CFI value; however, the TLI value was slightly lower and the RMSEA and SRMR values were higher than recommended: $\chi^2_{(20)}$ = 102.53, CFI = .96, TLI = .94, RMSEA = .12, 95% CI [.09, .14], SRMR = .09. The factor loadings of all items exceeded .50, ranging from .52 to .79, except for Item 1 whose factor loading was .48.

Based on the study conducted by Orgilés et al. (2022) and modification rates obtained, the items evaluating social anxiety (4 and 7) were correlated. The final fit of the Ecuadorian version of the SCAS-P-8 to a one-factor structure was adequate: $\chi^2_{(20)}$ = 38.80; CFI = .97; TLI = .97; RMSEA: .06, 90% CI [0.03, 0.08]; SRMR = .06. All the factor loadings were above .45, ranging from .46 to .68. Factor loadings were as follows: item 1 (.46), item 2 (.68), item 3 (.49), item 4 (.59), item 5 (.56), item 6 (.63), item 7 (.68) and item 8 (.68).

Table 1. Characteristics of the samples (children and parents) and differences by children's sex and age

	Total (n = 281)	Girls (n = 127)	Boys (n = 154)	Test[a]	Effect size[b]	8-9 years (n = 163)	10-12 years (n = 118)	Test[a]	Effect size[b]
Children									
Female, N (%)	127 (45.2)	127 (100)	0 (0)	-	-	70 (42.9)	57 (48.3)	0.79	-
Mean age (SD), years	9.39 (1.36)	9.44 (1.37)	9.35 (1.36)	-.55	-	8.36 (0.48)	10.81 (0.79)	-32.07***	3.74
8 years	104 (37)	46 (36.2)	58 (37.7)			104 (63.8)	0 (0)	281***	1
9 years	59 (21)	24 (18.9)	35 (22.7)			59 (36.2)	0 (0)		
10 years	50 (17.8)	24 (18.9)	26 (16.9)			0 (0)	50 (42.4)		
11 years	40 (14.2)	21 (16.5)	19 (12.3)			0 (0)	40 (33.9)		
12 years	28 (10)	12 (9.5)	16 (10.4)			0 (0)	28 (23.7)		
Mean number (SD) of siblings	1.30 (1.03)	1.35 (1.07)	1.25 (1.01)	-.86	-				
Informant									
Mother	242 (86.1)	109 (85.6)	133 (86.4)	.01	-	146 (89.6)	96 (81.4)	3.86	-
Other	39 (13.9)	18 (14.4)	21 (13.6)			17 (10.4)	22 (18.6)		
Group of age									
Under 25 years old	9 (3.2)	4 (3.1)	5 (3.2)	5.14	-	5 (3.1)	4 (3.4)	6.32	-
From 25 to 34 years old	102 (36.3)	46 (36.2)	56 (36.4)			67 (41.1)	35 (29.7)		
From 35 to 44 years old	130 (46.3)	56 (44.1)	74 (48.1)			70 (42.9)	60 (50.8)		
From 45 to 54 years old	36 (12.8)	19 (15)	17 (11)			20 (12.3)	16 (13.6)		
From 55 to 65 years old	2 (0.7)	2 (1.6)	0 (0)			1 (0.6)	1 (0.8)		
Over 65 years old	2 (0.7)	0 (0)	2 (1.3)			0 (0)	2 (1.7)		
Family situation									
Married	201 (71.4)	87 (68.5)	114 (74)	3.11	-	119 (42.3)	82 (29.2)	2.96	-
Separated or divorced	39 (13.9)	20 (15.7)	19 (12.4)			22 (7.8)	17 (14.4)		
Single	39 (13.9)	19 (15)	20 (13)			22 (13.5)	17 (14.4)		
Widowed	1 (0.4)	1 (0.8)	0 (0)			0 (0)	1 (0.8)		
Separated or divorced, and living with a partner	1 (0.4)	0 (0)	1 (0.6)			0 (0)	1 (0.8)		
Education									
PhD or Master	130 (46.2)	28 (22)	50 (32.5)	7.31	-	39 (23.9)	39 (33.1)	5.37	-
Undergraduate	78 (27.8)	60 (47.2)	70 (45.5)			75 (46)	55 (46.6)		
Secondary studies	40 (14.2)	18 (14.2)	22 (14.3)			25 (15.3)	15 (12.7)		
Primary studies	30 (10.7)	19 (15)	11 (7.1)			22 (13.5)	8 (6.8)		
Student	3 (1.1)	2 (1.6)	1 (0.6)			2 (1.2)	1 (0.8)		
Employment situation									
Full time	93 (33.1)	38 (29.9)	55 (35.7)	4.58	-	46 (28.2)	47 (39.8)	5.33	-
Part-time	33 (11.7)	14 (11)	19 (12.3)			20 (12.3)	13 (11)		
Self-employed	90 (32)	47 (37)	43 (27.9)			56 (34.4)	34 (28.8)		
Unemployed	59 (21)	27 (21.3)	32 (20.8)			36 (22.1)	23 (19.5)		
Housekeeper	6 (2.2)	1 (0.8)	5 (3.3)			5 (3)	1 (0.9)		
Socioeconomic level									
5000 or more	3 (1.1)	1 (0.8)	2 (1.3)	5.39	-	1 (0.6)	2 (1.7)	5.82	-
3000-4999	10 (3.6)	6 (4.7)	4 (2.6)			7 (4.3)	3 (2.5)		
2000-2999	23 (8.2)	11 (8.7)	12 (7.8)			13 (8)	10 (8.5)		
1000-1999	44 (15.7)	18 (14.2)	26 (16.9)			25 (15.3)	19 (16.1)		
500-999	55 (19.6)	31 (24.4)	24 (15.6)			26 (16)	29 (24.6)		
Up to 499	65 (23)	28 (22)	37 (24)			38 (23.3)	27 (22.9)		
No answer	81 (28.8)	32 (25.2)	49 (31.8)			53 (32.5)	28 (23.7)		

Note. M = Mean; SD = Standard Deviation; [a] Cross-table (χ^2) for categorical variables and Independent Samples *t* Test for continuous variables. [b] Effect size = Cramer's *V* for multi-categorical variables and Cohen's effect size for continuous variables. *** p < .001.

Psychometric properties and reliability evidence

The mean for the SCAS-P-8 was 9.89 (*SD* = 4.63) and the total ordinal alpha was .85. The reliability of the full scale did not improve in case of deleting items, therefore, all were retained. Corrected item-total correlations for the SCAS-P-8 varied from .41 to .61, indicating an acceptable homogeneity. The composite reliability was 0.81, indicating that approximately 81% of the observed variance in the items is attributable to the common variance among them, while the remaining 19% is due to the unique variance of each item or variable. Therefore, the items or variables are strongly related to each other, and the construct of anxiety is being assessed in a consistent way. The AVE index was 0.40, which is considered moderate and suggests that approximately 40% of the variance in the items is being explained by the underlying construct. While this value does not reach the threshold of 0.50 for optimal convergent validity, it remains reasonably acceptable (Hair et al., 2006). Descriptive statistics of the SCAS-P-8 (including corrected item-test correlations, means, and standard deviations) is shown on Table 2 for the total sample and subsamples, including boys, girls, children aged 8-9 and those aged 10-12 years old.

Sex and age invariance

Sex and age invariance for the SCAS-P-8 was examined for the final model in the Ecuadorian version of this tool (one-factor model, including a correlation between items 4 and 7, which evaluate social anxiety).

Regarding sex invariance, the configural invariance showed an excellent fit to the data (MLR χ^2 = 16.91; *df* = 38; CFI = 1; TLI = 1; RMSEA= 0), as shown on Table 3. The first more restrictive model, the weak invariance model, fit the data well. No changes in CFI, TLI and RMSEA between the configural and restrictive models were found, suggesting that the items used to estimate the factor loadings have the same meaning for girls and boys. The strong invariance model was the next restrictive model, and it also fit the data well. Considering ΔCFI, ΔTLI, and ΔRMSEA values, the factor loadings and item intercepts are invariant between sexes. The last level of invariance tested was the strict invariance model. Results suggest that the average item score comparison is valid between boys and girls. Therefore, the Ecuadorian version of the SCAS-P-8 proved to be invariant by sex in this sample. To determine whether children's age affected that measurement model, the sample was split into two groups: 1. Children aged 8-9 years old and 2. Children aged 10-12 years old. As shown on Table 3, the analyses supported the most restrictive level of invariance (strict invariance model), indicating that the SCAS-P-8 seems to be invariant by groups of age in this study.

Gender and age differences

Given the acceptable measurement invariance across sex and age, we compared the latent factor mean across sex and age. No difference in the SCAS-P-8 was observed between girls (*M* = 9.89; *SD* = 4.51) and boys (*M* = 9.89; *SD* = 4.75), *t* = -.003, *p* = .99. No difference in the SCAS-P-8 was observed between children aged 8 to 9 years old (*M* = 9.73;

Table 2. Psychometric characteristics of the Ecuadorian version of the SCAS-P-8

Item	Total M (SD)	Total r_{it}^c	Total α-i	Boys M (SD)	Boys r_{it}^c	Boys α-i	Girls M (SD)	Girls r_{it}^c	Girls α-i	Group of age 8-9 years old M (SD)	r_{it}^c	α-i	Group of age 10-12 years old M (SD)	r_{it}^c	α-i
1. Worries about things	1.52 (0.78)	.41	.84	1.54 (0.74)	.44	.87	1.49 (0.83)	.38	.81	1.52 (.89)	.46	.86	1.52 (0.72)	.32	.81
2. Feeling afraid	1.40 (0.83)	.61	.82	1.36 (0.81)	.72	.84	1.43 (0.87)	.48	.80	1.41 (.89)	.66	.84	1.37 (0.76)	.50	.78
3. Worries about being away from us	1.50 (0.87)	.43	.84	1.45 (0.86)	.46	.87	1.57 (0.89)	.40	.81	1.60 (0.90)	.55	.85	1.37 (0.81)	.26	.82
4. Afraid will make fool of self	1.61 (0.97)	.52	.83	1.66 (0.93)	.57	.86	1.54 (1.01)	.48	.80	1.46 (0.95)	.54	.86	1.81 (0.95)	.51	.79
5. Trouble going to school in mornings	0.47 (0.77)	.50	.83	0.48 (0.79)	.59	.85	0.46 (0.75)	.39	.81	0.44 (0.75)	.52	.85	0.53 (0.81)	.49	.78
6. Worries something bad happen to him/her	1.21 (0.90)	.56	.82	1.20 (0.92)	.59	.86	1.23 (0.88)	.53	.79	1.20 (0.92)	.56	.85	1.24 (0.88)	.58	.77
7. Worries what others think of him/her	1.26 (1.02)	.59	.82	1.26 (1)	.59	.85	1.27 (1.03)	.58	.78	1.18 (1.03)	.63	.84	1.38 (0.99)	.51	.79
8. All of a sudden feel really scared for no reason	0.93 (0.83)	.61	.82	0.94 (0.86)	.58	.86	0.91 (0.85)	.65	.77	0.94 (0.88)	.63	.84	0.90 (0.81)	.58	.77
Total	9.89 (4.63)	-	-	9.89 (4.75)	-	-	9.89 (4.51)	-	-	9.73 (4.93)	-	-	10.11 (4.20)	-	-
α	.85			.87			.82			.87			.82		

Note. M = Mean; *SD*= Standard Deviation; r_{it}^c = corrected item-total correlation; α-i = ordinal alpha if the item is removed; α = ordinal alpha.

SD = 4.93) and those aged 10 to 12 years old (*M* = 10.11; *SD* = 4.20), *t* = -.68, *p* = .49. These results suggest that the level of anxiety is equivalent by sex and age in Ecuadorian children between 8 and 12 years old, according to the assessment of their parents.

Discussion

Accurate assessment of anxiety symptoms in children is crucial for proper diagnosis, treatment planning, and monitoring treatment outcomes (Silverman & Ollendick, 2005). The use of reliable assessment instruments can aid in the early detection of anxiety disorders, which in turn can lead to more effective treatment and better outcomes for children. The current study aimed to assess the psychometric and structural properties of the Ecuadorian version of the SCAS-P-8 and examine its gender and age factorial invariance. Results indicated that the SCAS-P-8 is a psychometrically reliable tool for measuring anxiety among Ecuadorian children from 8 to 12 years of age, based on parental assessments. The findings indicated that the one-factor structure provided a good fit for the data, and that the structure is invariant across gender and age, indicating that it is suitable for both boys and girls of different ages with comparable accuracy.

Results indicated that the one-factor structure provided a good fit for the data, with adequate TLI, RMSEA, and SRMR values. This structure has been previously supported for the SCAS-8, both in the children and parent versions (Reardon et al., 2018; Rodríguez-Menchón et al., 2022). Factor loadings ranged from .46 to .68, with Item 1 ("Worries about things") and Item 3 ("Worries about being away from us") showing lower factor loadings and correlations. These results differ from the study of the SCAS-C-8 set forth by Rodríguez-Menchón et al. (2022), which showed lower loadings and correlations in Item 5 ("Trouble going to school in the mornings") and Item 6 ("Suddenly start to tremble or shake"). The lower loadings and correlations found in the present study may have been explained by the difficulty of operationalising the construct of "worry". Both items were kept in accord with Rodríguez-Menchón et al. (2022)

due to the shortness of the scale and the need for further cross-cultural comparisons.

In terms of psychometric properties and reliability evidence, the mean score for the SCAS-P-8 was 9.89 (*SD* = 4.63) and the total ordinal alpha was .85. The corrected item-total correlations for the SCAS-P-8 varied from .41 to .61, indicating an acceptable level of homogeneity. No improvement in the reliability of the full scale was observed upon deleting items.

This study aimed to examine differences between girls and boys, and between children aged 8 to 9 years old and those aged 10 to 12 years old, regarding their reported levels of anxiety as assessed by their parents. Surprisingly, our analysis did not reveal any significant differences in anxiety levels between girls and boys, nor did we observe variations in anxiety scores across different age groups. These findings are noteworthy and warrant further explanation. In contrast to previous research conducted in various countries (Arendt et al., 2014; Orgilés et al., 2011; Rodríguez-Menchón et al., 2022), our results differ in terms of gender-related anxiety differences. Notably, other studies have found differences when using the children-reported version of the brief scale but not when using the parent-reported brief scale (Reardon et al., 2018). Several potential explanations for these differences exist. First, it is plausible that certain cultural norms and parenting practices in Ecuador create an environment where anxiety symptoms are perceived and reported similarly in both boys and girls. Furthermore, there have been no prior epidemiological investigations into anxiety symptoms specifically in Ecuadorian children, indicating a need to explore this disparity between genders to clarify the findings. Second, some authors suggest that gender differences in anxiety might be more pronounced in adolescence than in childhood (Arendt et al. 2014), which is supported by findings from a recent study on the SCAS in Mainland China, where differences in mean SCAS scores were much greater between genders in adolescence compared to differences in childhood (Zhao et al., 2012). As the current study's sample did not include adolescents, this might have influenced the lack of gender differences observed in anxiety levels. Third, it is possible that parents participating in the study might have been more aware of

Table 3. Gender and age invariance: Summary of goodness-of-fit indices

Level of invariance	χ^2	*df*	*p*	RMSEA	CFI	TLI	ΔCFI	ΔTLI	ΔRMSEA
Gender									
Configural invariance	16.91	38	.99	0	1	1	-	-	-
Weak invariance	27.30	45	.98	0	1	1	0	0	0
Strong invariance	29.84	52	.99	0	1	1	0	0	0
Strict invariance	41.29	60	.96	0	1	1	0	0	0
Age									
Configural invariance	15.28	38	1	0	1	1	-	-	-
Weak invariance	30.28	45	.95	0	1	1	0	0	0
Strong invariance	41.06	52	0.86	0	1	1	0	0	0
Strict invariance	45.45	60	0.91	0	1	1	0	0	0

Note. χ^2 = Santorra-Bentler Scaled Chi-Square; *df* = Degrees of Freedom; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; RMSEA = Root Mean Square Error of Approximation; ΔCFI = Increase of the CFI value; ΔTLI = Increase of the TLI value; ΔRMSEA = Increase of the RMSEA value.

anxiety symptoms in their children, resulting in a sample with a higher proportion of anxious boys compared to the general population. Future epidemiological research including multi-informant assessment to evaluate gender differences in anxiety symptoms is warranted.

Regarding the absence of significant age-related differences in anxiety, our findings contrast with studies reporting age-related variations in anxiety symptom trajectories, with older children typically exhibiting higher levels of anxiety symptoms than younger children (Allan et al., 2014). One possible explanation for these dissimilarities could be related to the relatively narrow age range of our sample (8 to 12 years of age). It is plausible that the developmental changes in anxiety symptoms might be more subtle within this particular age span, and any potential age-related differences could emerge outside the scope of our study. Further investigation with a broader age range might provide a more comprehensive understanding of the developmental patterns of anxiety in Ecuadorian children.

Finally, the SCAS-P-8 one-factor structure was invariant across age and sex, which indicates that the SCAS-P-8 measures anxiety in an equivalent way across different age and gender groups in this sample, and that the differences in the scale scores are meaningful and can be compared.

It is also important to consider the limitations of the present study when interpreting the results. One limitation is the relatively small sample size, which may have affected the reliability of the SCAS-P-8. Another limitation of the study is that validity and test-retest reliability were not examined in this study. Also, while the SCAS-P-8 has been shown to be a reliable measure of anxiety symptoms when completed by parents, it would be interesting to compare the results of parent and child reports to see if there is agreement between informants. This would help to further validate the use of the SCAS-P-8 in measuring anxiety symptoms in children. Another limitation is that this study was conducted only a in community sample, and the generalisation of the results to clinical samples should be made with caution.

Despite these limitations, the results from the present study provide important contributions to the field of anxiety assessment. To the best of our knowledge, this is the first study to examine the psychometric properties of the SCAS-P-8 in an Ecuadorian population. The results suggest that the SCAS-P-8 is a psychometrically reliable tool for measuring anxiety in Ecuadorian children, according to the assessment of their parents. The results of the factorial gender and age invariance analyses conducted in this study indicate that the measurement properties of the Ecuadorian version of the SCAS-C-8 are not influenced by gender or by age group, meaning that the scale is measuring anxiety in the same way for both males and females across different ages.

In summary, the findings of this study indicate that the Ecuadorian version of the SCAS-P-8 is an adequate measure for assessing anxiety symptoms in children from 8 to 12 years of age, as reported by their parents. These results are in line with prior research on anxiety assessment in pediatric populations and represent a significant contribution to the field of anxiety measurement in childhood. Given its brief and accurate nature, the SCAS-P-8 is considered to be a useful tool for use in both research and clinical settings for evaluating anxiety symptoms in children in Ecuador.

References

Ahlen, J., Vigerland, S., & Ghaderi, A. (2018). Development of the Spence Children's Anxiety Scale - Short Version (SCAS-S). *Journal of Psychopathology and Behavioral Assessment, 40*(2), 288-304. https://doi.org/10.1007/s10862-017-9637-3

Allan, N. P., Capron, D. W., Lejuez, C. W., Reynolds, E. K., MacPherson, L., & Schmidt, N. B. (2014). Developmental trajectories of anxiety symptoms in early adolescence: The influence of anxiety sensitivity. *Journal of Abnormal Child Psychology, 42*(4), 589-600. https://doi.org/10.1007/s10802-013-9806-0

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

Arendt, K., Hougaard, E., & Thastum, M. (2014). Psychometric properties of the child and parent versions of Spence Children's Anxiety Scale in a Danish community and clinical sample. *Journal of Anxiety Disorders, 28*(8), 947-956. https://doi.org/10.1016/j.janxdis.2014.09.021

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233-255. https://doi.org/10.1207/S15328007SEM0902_5

Creswell, C., Waite, P., & Hudson, J. (2020). Practitioner review: Anxiety disorders in children and young people–assessment and treatment. *Journal of Child Psychology and Psyquiatry, 61*, 628–643. https://doi.org/10.1111/jcpp.13186

DeSousa, D. A., Pereira, A. S., Petersen, C. S., Manfro, G. G., Salum, G. A., & Koller, S. H. (2014). Psychometric properties of the Brazilian-Portuguese version of the Spence Children's Anxiety Scale (SCAS): Self- and parent-report versions. *Journal of Anxiety Disorders, 28*(5), 427-436. https://doi.org/10.1016/j.janxdis.2014.03.006

Emslie, G. J. (2008). Pediatric Anxiety — Underrecognized and undertreated. *New England Journal of Medicine, 359*(26), 2835-2836. https://doi.org/10.1056/NEJMe0809401

Essau, C. A., Lewinsohn, P. M., Olaya, B., & Seeley, J. R. (2014). Anxiety disorders in adolescents and psychosocial outcomes at age 30. *Journal of Affective Disorders, 163*, 125-132. https://doi.org/10.1016/j.jad.2013.12.033

Forero, C. G., Maydeu-Olivares, A., & Gallardo-Pujol, D. (2009). Factor analysis with ordinal indicators: A Monte Carlo study comparing DWLS and ULS estimation. *Structural Equation Modeling, 16*(4), 625-641. https://doi.org/10.1080/10705510903203573

Freidl, E. K., Stroeh, O. M., Elkins, R. M., Steinberg, E., Albano, A. M., & Rynn, M. (2017). Assessment and treatment of anxiety among children and adolescents. *Focus, 15*(2), 144-156. https://doi.org/10.1176/appi.focus.20160047

Gadermann, A. M., Guhn, M., & Zumbo, B. D. (2012). Estimating ordinal reliability for likert-type and ordinal item response data: A conceptual, empirical, and practical guide. *Practical*

Assessment, Research & Evaluation, 17(3), 1-13. https://doi.org/10.7275/n560-j767

Gundel, L. K., Pedersen, C. B., Munk-Olsen, T., & Dalsgaard, S. (2018). Longitudinal association between mental disorders in childhood and subsequent depression – A nationwide prospective cohort study. *Journal of Affective Disorders, 227*, 56-64. https://doi.org/10.1016/j.jad.2017.10.023

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6ª ed.). Pearson.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Hyland, S., Mackin, D. M., Goldstein, B. L., Finsaas, M. C., & Klein, D. N. (2022). Agreement, stability, and validity of parent- and youth-reported anxiety symptoms from childhood to adolescence. *Research on Child and Adolescent Psychopathology, 50*(11), 1445-1455. https://doi.org/10.1007/s10802-022-00941-1

Institute of Health Metrics and Evaluation. (2019). *Global Health Data Exchange (GHDx)*. https://vizhub.healthdata.org/gbd-results/

Kara, A. (2022). A review of childhood anxiety. *Journal of Clinical Trials and Experimental Investigations, 1*(3), 64-70. https://doi.org/10.5281/zenodo.7213694

Kimber, M., Rehm, J., & Ferro, M. A. (2015). Measurement Invariance of the WHODAS 2.0 in a population-based sample of youth. *Plos One, 10*, e0142385. https://doi.org/10.1371/journal.pone.0142385

Kohn, R. (2018). Epidemiology of common mental disorders. In H. Budde & M. Wegner (Eds.), *The exercise effect on mental health: Neurobiological mechanisms* (1st ed.). CRC Press. https://doi.org/10.4324/9781315113906

Larzabal-Fernandez, A., Pilco, K., Moreta-Herrera, R., & Rodas, J. A. (2023). Psychometric properties of the Kesler Psychological Distress Scale in a sample of adolescents from Ecuador. *Child Psychiatry and Human Development*, 1-10. https://doi.org/10.1007/s10578-023-01501-4

Lyneham, H. J., Street, A. K., Abbott, M. J., & Rapee, R. M. (2008). Psychometric properties of the School Anxiety Scale—Teacher Repor (SAS-TR). *Journal of Anxiety Disorders, 22(2)*, 292-300. https://doi.org/10.1016/j.janxdis.2007.02.001

MacCallum, R. C., Brown, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*(2), 130-149. https://doi.org/10.1037/1082-989X.1.2.130

March, J. S. (2012). *Multidimensional anxiety scale for children* (2nd Edition). MultiHealth Systems. *MASC 2.*

Mohammad, M. R., Ahmadi, N., Yazdi, F. R., Khaleghi, A., Mostafavi, S. A., Hooshyari, Z., Molavi, P., Sarraf, N., Hojjat, S. K., Mohammadzadeh, S., Amiri, S., Arman, S., Ghanizadeh, A., Ahmadipour, A., Ostovar, R., Nazari, H., Hosseini, S. H., Golbon, A., Derakhshanpour, F., … Mehrparvar, A. H. (2020). Prevalence, comorbidity and predictors of anxiety disorders among children and adolescents. *Asian Journal of Psychiatry, 53*(102059). https://doi.org/10.1016/j.ajp.2020.102059

Morales-Muñoz, I., Mallikarjun, P. K., Chandan, J. S., Thayakaran, R., Upthegrove, R., & Marwaha, S. (2023). Impact of anxiety and depression across childhood and adolescence on adverse outcomes in young adulthood: A UK birth cohort study. *The British Journal of Psychiatry, 222*(5), 212-220. 1-9. https://doi.org/10.1192/bjp.2023.23

Muris, P., Merckelbach, H., Van Brakel, A., & Mayer, A. B. (1999). The revised version of the Screen for Child Anxiety Related Emotinal Disorders (SCARED-R): Further evidence for its reliability and validity. *Anxiety, Stress, and Coping, 12*(4), 411-425. https://doi.org/10.1080/10615809908249319

Nauta, M. H., Scholing, A., Rapee, R. M., Abbott, M., Spence, S. H., & Waters, A. (2004). A parent-report measure of children's anxiety: Psychometric properties and comparison with child-report in a clinic and normal sample. *Behaviour Research and Therapy, 42*(7), 813-839. https://doi.org/10.1016/S0005-7967(03)00200-6

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). McGraw-Hill.

Orgilés, M., Garrigós, E., Espada, P., & Morales, A. (2020). How does a CBT-based transdiagnostic program for separation anxiety symptoms work in children? Effects of Super Skills for Life. *Revista de Psicología Clínica con Niños y Adolescentes, 7*(2), 2020-2029. https://doi.org/10.21134/rpcna.2020.07.2.1

Orgilés, M., Méndez, X., Spence, S. H., Huedo-Medina, T. B., & Espada, J. P. (2011). Spanish validation of the Spence Children's Anxiety Scale. *Child Psychiatry and Human Development, 43*, 271-281. https://doi.org/10.1007/s10578-011-0265-y

Orgilés, M., Morales, A., Espada, J. P., & Rodríguez-Menchón, M. (2022). Early detection of anxiety problems in childhood: Spanish validation of the brief Spence Children's Anxiety Scale for parents. *Clinical Child Psychology and Psychiatry, 27*(3), 836-851. https://doi.org/10.1177/13591045221089907

Orgilés, M., Rodríguez-Menchón, M., Fernández-Martínez, I., Morales, A., & Espada, J. P. (2019). Validation of the parent report version of the Spence Children's Anxiety Scale (SCAS-P) for Spanish children. *Clinical Child Psychology and Psychiatry, 24*(4), 776-790. https://doi.org/10.1177/1359104519835579

Reardon, T., Creswell, C., Lester, K. J., Arendt, K., Blatter-Meunier, J., Bögels, S. M., Coleman, J. R. I., Cooper, P. J., Heiervang, E. R., Herren, C., Hogendoorn, S. M., Hudson, J. L., Keers, R., Lyneham, H. J., Marin, C. E., Nauta, M., Rapee, R. M., Roberts, S., Schneider, S., … Eley, T. C. (2019a). The utility of the SCAS-C/P to detect specific anxiety disorders among clinically anxious children. *Psychological Assessment, 31*(8), 1006-1018. https://doi.org/10.1037/pas0000700

Reardon, T., Harvey, K., & Creswell, C. (2019b). Seeking and accessing professional support for child anxiety in a community sample. *European Child & Adolescent Psychiatry. 29,* 649-664. https://doi.org/10.1007/s00787-019-01388-4

Reardon, T., Spence, S. H., Hesse, J., Shakir, A., & Creswell, C. (2018). Identifying children with anxiety disorders using brief versions of the Spence Children's Anxiety Scale for children, parents, and teachers. *Psychological Assessment, 30*(10), 1342-1355. https://doi.org/10.1037/pas0000570

Rodríguez-Menchón, M., Orgilés, M., Espada, J. P., & Morales, A. (2022). Validation of the brief version of the Spence Children's Anxiety Scale for Spanish children (SCAS-C-8). *Journal of Clinical Psychology, 78*(6), 1093-1102. https://doi.org/10.1002/jclp.23263

Silverman, W. K., & Ollendick, T. H. (2005). Evidence-based assessment of anxiety and its disorders in children and adolescents. *Journal of Clinical Child and Adolescent Psychology, 34*(3), 380-411. https://doi.org/10.1207/s15374424jccp3403_2

Spence, S. H. (1997). Structure of anxiety symptoms among children: A confirmatory factor-analytic study. *Journal of Abnormal Psychology, 106*(2), 280-297. https://doi.org/10.1037/0021-843X.106.2.280

Spence, S. H. (1998). A measure of anxiety symptoms among children. *Behaviour Research and Therapy, 36*(5), 545-566. https://doi.org/10.1016/S0005-7967(98)00034-5

Spence, S. H. (2018). Assessing anxiety disorders in children and adolescents. *Child and Adolescent Mental Health, 23*(3), 266-282. https://doi.org/10.1111/camh.12251

Spence, S. H., Rapee, R., McDonald, C., & Ingram, M. (2001). The structure of anxiety symptoms among preschoolers. *Behaviour Research and Therapy, 39*(11), 1293-1316. https://doi.org/10.1016/S0005-7967(00)00098-X

Team, R. (2018). *RStudio: integrated development for R* (Version 1.1.453). Computer software.

Timmons, A. C. (2010). *Establishing factorial invariance for multiple group confirmatory factor analysis.* KUant Guide, 22.1. https://acortar.link/cePojl

Vidair, H. B., Reyes, J. A., Shen, S., Parrilla-Escobar, M. A., Heleniak, C. M., Hollin, I. L., Woodruff, S., Turner, J. B., & Rynn, M. A. (2011). Screening parents during child evaluations: Exploring parent and child psychopathology in the same clinic. *Journal of the American Academy of Child & Adolescent Psychiatry, 50*(5), 441-450. https://doi.org/10.1016/j.jaac.2011.02.002

Whiteside, S. P., & Brown, A. M. (2008). Exploring the utility of the Spence Children's Anxiety Scale parent-and child-report forms in a North American sample. *Journal of Anxiety Disorders, 22*(8), 1440-1446. https://doi.org/10.1016/j.janxdis.2008.02.006

World Health Organization. (2021, February 19). *Adolescent Mental Health.* https://www.who.int/news-room/fact-sheets/detail/adolescent-mental-health

Zhao, J., Xing, X., & Wang, M. (2012). Psychometric properties of the Spence Children's Anxiety Scale (SCAS) in Mainland Chinese children and adolescents. *Journal of Anxiety Disorders, 26*(7), 728-736. https://doi.org/10.1016/j.janxdis.2012.05.006