The Liebowitz Social Anxiety Scale for Children and Adolescents

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The purpose of this study was to analyze the component structure and reliability of the Liebowitz Social Anxiety Scale for Children and Adolescents, self-report version (LSAS-CA-SR), in a Spanish community population. The sample was made up of 422 students from elementary and high schools, aged between 10 and 17 years. Exploratory factor analysis isolated one component for the Anxiety subscale and one component for the Avoidance subscale. Medium-strong associations were found between the total score and subscale scores. LSAS-CA-SR scores had stronger associations with instruments of social anxiety. Internal consistency for the Fear subscale was .91, and for the Avoidance subscale, it was .89. Gender and age effects were assessed for LSAS-CA-SR scores. Effect sizes for age and gender and interaction of age and gender were very low on both the Fear and the Avoidance subscales. There were significant differences between female and male means on the Fear subscale. The findings suggest that the LSAS-CA-SR is reliable and valid.

La Escala de Ansiedad Social de Liebowitz para Niños y Adolescentes. El objetivo de este estudio fue analizar la estructura factorial y la fiabilidad de la Escala de Ansiedad Social para Niños y Adolescentes de Liebowitz en su versión autoinforme (LSAS-CA-SR), en una muestra comunitaria española de 422 estudiantes entre 10 y 17 años. El análisis factorial exploratorio aisló un componente para la subescala de ansiedad y un componente para la subescala de evitación. Las correlaciones entre la puntuación total y las puntuaciones de las subescalas fueron de medias a elevadas. Las puntuaciones de la LSAS-CA-SR obtuvieron correlaciones elevadas con otras medidas de ansiedad social. La consistencia interna en la subescala de miedo fue de 0,91, y en la subescala de evitación de 0,89; los tamaños del efecto para la edad y el género y su interacción fueron bajos en ambas. Sin embargo, se encontraron diferencias significativas entre varones y mujeres en la subescala de miedo. Los hallazgos sugieren que la adaptación de la LSAS-CA-SR es fiable y válida.

Social phobia is defined as a marked and persistent fear of one or more social situations in which the person is exposed to possible scrutiny by others and fears that he or she may do something or act in a way that will be humiliating or embarrassing (APA, 2000).

Studies on the course and treatment of social phobia in Spanish children and adolescents are few (Rosa, Olivares, & Iniesta, 2009). One reason may be that there are few assessment and diagnostic instruments for the young Spanish-speaking population. However, there are a number of instruments to assess social phobia in other cultures. One of these that has been tested empirically is the Liebowitz Social Anxiety Scale for Children and Adolescents (LSAS-CA-SR; Masia-Warner et al., 2003). The LSAS-CA-SR has an interview format and it includes situations which are modifications of the adult version (LSAS; Liebowitz, 1987). It contains 24 items: 12 items are social interaction situations, and the other 12 are performance situations. Each item assesses the fear level and the avoidance level on a Likert type scale: Clinician

ratings of anxiety (0= none, 1= mild, 2= moderate, 3= severe) and avoidance (0= never, 1= occasionally, 2= often, 3= usually). It provides seven scores: (1) anxiety related to social interaction, (2) performance anxiety, (3) total anxiety, (4) avoidance of social interaction, (5) avoidance of performance situations, (6) total avoidance, and (7) a total score.

Masia-Warner et al. (2003) and Storch et al. (2006) evaluated the psychometric properties of the LSAS-CA-SR in a clinician-administered format. They found that is a reliable and valid instrument for assessing social phobia in youngsters. The scores showed excellent internal consistency for the total score as well as for the specific subscale scores. No results on factor analysis were found by the authors. However an appropriate structure for instruments of fear and avoidance has been found, with excellent psychometric properties in self-report format for Spanish children and adolescents (Olivares, Sánchez-García, Rosa, & Piqueras, 2004). This report presents the factorial structure, reliability and validity in the same population using a self-report version of LSAS-CA-SR.

Method

Participants

In this study we used a community sample. The sample size was 454 participants, 32 (7.05%) were excluded from this research

due to mistakes in their answers or because they did not have parental authorization to participate in the study. Finally, the Spanish sample comprised 422 participants (52% male and 48% female) from elementary and high schools in the region of Murcia, Spain. The participants were registered students at 11 public and state-assisted educational centres, selected at random from urban areas. The mean age was 13.5 years old (SD= 2.25), and the range was between 10 and 17 years old.

Instruments

To obtain information about the concurrent validity of LSAS-CA-SR we used other tests of social phobia: The Social Phobia and Anxiety Inventory for Children (SPAI-C; Beidel, Turner, & Morris, 1995), the Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1998), the Social Phobia Scale (SPS) and the Social Interaction Anxiety Scale (SIAS) (Mattick & Clarke, 1998), and Self-Statements related to Public Speaking (SSPS; Hofmann & DiBartolo, 2000).

SPAI-C (Beidel et al., 1995) contains 26 items that assess anxiety experienced in social situations. SPAI-C is internally consistent (α= .95) and its test-retest reliability is good (Beidel et al., 1995). SPAI-C showed good psychometric properties in both Spanish-speaking children and adolescent populations (α= .94; Olivares et al., 2004).

The SAS-A (La Greca & López, 1998) consists of 22 items grouped into three subscales: fear of negative evaluations from peers (FNE), avoidance of new social situations (SASD-N), and generalized social inhibition (SAD-G). SAS-A showed good psychometric properties in Spanish-speaking children and adolescent populations (Olivares et al., 2005).

The SPS and the SIAS were developed by Mattick and Clarke (1998). SIAS assesses anxiety behaviour in social relations and SPS assesses performance anxiety. Both tests showed good psychometric properties in both Spanish-speaking children and adolescent populations (α= .93 –SPS- y .90 –SIAS-; Olivares, Hidalgo, Rivero, Piqueras, & Amorós, 2004).

The SSPS (Hofmann & DiBartolo, 2000) assesses the grade of discomfort experienced by the subject while speaking in public or acting in front of an audience. It contains 10 items divided into two subscales: The SSPS-N contains five items with negative self-statements, and the SSPS-P contains five items with positive self-statements. The SSPS-N and the SSPS-P showed good psychometric properties in Spanish-speaking adolescent populations (α= .856 –SSPS-N– ; α= .686 –SSPS-P– and α= .534 –SSPS–; Rivero, 2005).

Procedure

Following Balluerka, Gorostiaga, Alonso-Arbiol and Aramburu (2007), the LSAS-CA-SR was translated into Spanish by a professional translator an the translation was checked by a Spanis bilingual clinical psychologist. The both versions were sent to a bilingual native North American, a clinical psychologist of renowned prestige and specialist in evaluating anxiety disorders in children and adolescents. This expert also checked the meaning of the items in the original version and the translation was the same. After our expert had verified that this was the case, the instrument was applied in a pilot study (range: 10-17 years old) (Olivares et al., 2004).

Prior to the application of the instruments, we presented the objectives of the research to the directors and psychologists of the participant educational centres, the evaluation instruments were described, and we sought permission to carry out the research. Additionally we encouraged the directors' and psychologists' collaboration in the investigation. Subsequent meetings were held with parents in order to explain the study, and to ask permission for their children to participate. All instruments were applied in the classroom. LSAS-CA-SR instructions were read aloud according to Fresco et al. (2001).

Data analysis

To evaluate the dimensional structure of the LSAS-CA-SR, a principal component analysis of a polychoric correlation matrix between items of the test was carried out for both scales (fear and avoidance) using MicroFACT (Waller, 2001). To obtain a factor solution with MicroFACT, it is necessary to specify the number of dimensions. MicroFACT shows several goodness-of-fit indices (GFI and residual statistics) that enable us to make decisions on the relevant number of dimensions. We also used a scree-plot to assist the decision about the number of components.

The reliability of each subscale was obtained with Cronbach's alpha coefficient. In addition, the LSAS-CA-SR concurrent validation with the other scales was calculated. We also used ANOVA to calculate the effect size and statistical significance for different variables (gender and age).

Results

Descriptive analysis of the LSAS-CA-SR

The mean fear subscale score was 13.58 (SD= 10.68) ranging between 0 and 61, while the mean on the avoidance subscale was 14.99 (SD= 11.53), ranging between 0 and 72. Both distributions were non normal because the nonparametric test of Kolmogorov-Smirnov was significant (fear scale, KS= .894, p<.000, and avoidance scale, KS= .894, p<.000). A possible explanation could be that this result may be affected by the high sample size however. The mean total score of this sample was 28.58 (SD= 20.49), with the scores ranging from 0 to 98.

Structural validity

Since MicroFACT requires the specification of the number of dimensions, we tested the goodness-of-fit index and the mean square residual with one, two or more factors to check the correct dimensionality of subscales. Satisfactory values for GFI may be .95 or greater and the mean residual around .02 (McDonald, 1999). Table 1 presents the GFI and the mean residual for fear and avoidance subscales with one and two dimensions.

The GFI index was greater than .96, on both subscales (fear and avoidance), and the mean of residuals was less than .02, with only one dimension. Thus we believe that a unidimensional solution for both scales is the appropriate solution. Furthermore, the scree-plot (not included) suggested the same solution. Table 2 presents the components' loadings and the eigenvalues of the fear and avoidance subscales of the LSAS-CA-SR.

An examination of the components' loadings showed the existence of medium item-trait correlations, which ranged

Table 1
Goodness-of-fit indices for LSAS-CA-SR subscales

	Fear Scale		Avoidance Scale	
	One factor	Two factors	One factor	Two factors
GFI	.9728	.9806	.9657	.9752
MSR	.0054	.0039	.0060	.0044
MR	.0252	.0224	.0264	.0235

GFI: Goodness-of-Fit Index
MSR: Mean Square Residual
MR: Mean Residual

correlation (.52) was between the fear and the avoidance subscales. The correlation between subscales, which assesses fear and avoidance in social relations, was .67, the same as the correlation between the subscale assessment for fear and avoidance in social performance.

Concurrent validity

There is a good association between LSAS-CA-SR and other instruments that assess social phobia (table 5). Correlations between the LSAS-CA-SR subscales and these instruments oscillated between .44 and .77, except with the SSPS scale, which

Table 2
Factor loadings for LSAS-CA-SR (self-report) fear and avoidance scales

Items (in both subscales)	Component LMT*	Component LME*
1. Talking to classmates or others on the telephone	.536	.587
2. Participating in work groups in the classroom	.640	.684
3. Eating in front of others (e.g., school cafeteria, restaurants)	.572	.587
4. Asking an adult you don't know well, like a store clerk, principal, or policeman for help (e.g., for directions or to explain something that you don't understand)	.650	.636
5. Giving a verbal report or presentation in class (e.g., show and tell for younger children)	.658	.641
6. Going to parties, dances, or school activities	.642	.709
7. Writing on the chalkboard or in front of others	.588	.613
8. Talking with other kids you don't know well	.666	.588
9. Starting a conversation with people you don't know well	.676	.616
10. Using school or public bathrooms	.463	.408
11. Going into a classroom or another place (e.g., Church, food court seating) when others are already seated	.683	.678
12. Having people pay close attention to you or being the center of attention (e.g., your own birthday party)	.688	.618
13. Asking questions in class	.710	.696
14. Answering questions in class	.699	.703
15. Reading out loud in class	.665	.620
16. Taking tests	.577	.452
17. Saying «no» to others when they ask you to do something that you don't want to do (like borrow something or look at your homework)	.612	.562
18. Telling others that you disagree or that you are angry with them	.671	.572
19. Looking at people you don't know well in the eyes	.648	.640
20. Returning something in a store	.650	.629
21. Playing a sport or performing in front of other people (e.g., gym class, dancing school recital, musical concert)	.653	.605
22. Joining a club or organization	.684	.653
23. Meeting new people or strangers	.683	.657
24. Asking a teacher permission to leave the classroom (like to go to the bathroom or to the nurse)	.679	.605
λ (% explained variance for each component)	9.948 (41.5%)	9.190(38.3%)

* Description in Table 3

between .463 and .710 for the total fear subscale, and between .408 and .709 for the total avoidance subscale. Item 10 obtained the lowest loadings on both subscales (using school toilets or other public places), .463 on the fear subscale and .408 on the avoidance subscale, while item 13 (asking in class) obtained the highest loading (.710) on the fear subscale, and item 6 (Going to parties, dances, or school activities) obtained the highest loading (.709) on the avoidance subscale.

Correlations between LSAS-CA-SR scores

The range of scores for fear and avoidance on the social performance and the social relation subscales are shown in table 3.

Correlations between the total LSAS-CA-SR score and subscales ranged between .52 and .92 (table 4). The lowest

Table 3
Scores range of LSAS-CA-SR subscales

Fear of relationship subscale (LMS)	
Grade of fear (0-3) for items: 1, 4, 6, 8, 9, 12, 17, 18, 19, 20, 22, 23	0 – 36
Avoidance of relationship subscale (LES)	
Grade of avoidance (0-3) for ítems: 1, 4, 6, 8, 9, 12, 17, 18, 19, 20, 22, 23	0 – 36
Fear of performance subscale (LMA)	
Grade of fear (0-3) for items: 2, 3, 5, 7, 10, 11, 13, 14, 15, 16, 21, 24	0 – 36
Avoidance of performance subscale (LEA)	
Grade of avoidance (0-3) for ítems: 2, 3, 5, 7, 10, 11, 13, 14, 15, 16, 21, 24	0 – 36
Total fear subscale (LMT)	
(subscales LMS and LMA)	0 – 72
Total avoidance subscale (LET)	
(subscales LES and LEA)	0 – 72
Total Score	
(subscales LMT and LET)	0 – 154

oscillated between .28 and .41. The highest associations are with SPAI-C, with .77 for the total fear subscale and .71 for the total avoidance subscale. The LSAS-CA-SR total scale obtained higher correlations with the social anxiety instruments (.62-.73) except with SSPS (.40). The highest correlation was between the LSAS-CA-SR total score and the SPAI-C inventory.

Internal consistency

The alpha coefficient oscillated between .81 and .94 (Table 6). The internal consistency of fear scores was .91, and for avoidance scores it was .89.

Inferential analysis of social anxiety in childhood and adolescence

A two-way ANOVA was carried out to ascertain if there are significant differences on gender, age and their interaction in fear and avoidance subscales. The test of homogeneity of variance was not significant. Effect sizes for age (η^2= .027), gender (η^2= .013) and the interaction age × gender (η^2= .027) were very low on fear and avoidance subscales; however, significant differences were found for boys and girls (F= 5.518, df= 1, 404, p= .019), with girls obtaining a higher score. Table 7 shows the means and standard

deviations of gender and age in fear and avoidance subscales. Effect sizes for age (η^2= .027), gender (η^2= .002) and the interaction gender × age (η^2= .033) are also very low on the avoidance subscale. Moreover, no significant differences were found in the principal effects and their interaction.

Discussion

The factorial structure of the self-report version, LSAS-CA-SR, showed two factors, one for the fear subscale that explains 41.5% of total variance, and one for the avoidance subscale that explains 38.3% of total variance. Moreover, the factor loadings were high in fear and avoidance subscales, except in item 10 (using school or public bathrooms), in agreement with the results from a previous study (Olivares et al., 2004). The percentage of explained variance is similar to other studies (e.g., Olivares et al., 2004) where only one factor each was found for the fear subscale of LSAS-CA-SR (29%) and the avoidance subscale (25%).

In relation to the association between LSAS-CA-SR scores, we found that the correlation between fear and avoidance in social relation and social performance was high (.74), giving support to the unidimensional structure in both subscales. Thus, the results showed moderate correlation when associations were analyzed between the fear subscale and the avoidance subscale. As expected, the lowest correlations were between fear, from the

Table 4
Correlations between total score and LSAS-CA-SR subscales

	Total Score	LMT*	LMS*	LMA*	LET*	LES*	LEA*
Total Score	1	.92	.85	.85	.93	.85	.85
LMT*		1	.93	.93	.70	.65	.64
LMS*			1	.74	.65	.67	.52
LMA*				1	.65	.52	.67
LET*					1	.92	.92
LES*						1	.68
LEA*							1

* (Description in Table 3)
Note: All correlations were statistically significant at p<0.001

Table 5
Correlations of LSAS-CA-SR with other instruments of social anxiety

	SPAI-C	SAS-A	SPS	SIAS	SSPS
Total Score	.73	.62	.68	.65	.40
LMT*	.77	.64	.70	.67	.41
LMS*	.73	.62	.65	.66	.41
LMA*	.71	.57	.65	.59	.37
LET*	.59	.51	.55	.53	.33
LES*	.56	.51	.54	.54	.33
LEA*	.52	.43	.48	.44	.28

* (Description in Table 3)
Note: The Social Phobia and Anxiety Inventory for Children (SPAI-C; Bediel, Turner & Morris, 1995); Social Anxiety Scale for Adolescents, SAS-A; La Greca & López, 1998); Social Phobia Scale (SPS) and Social Interaction Anxiety Scale (SIAS) (Mattick & Clarke,1989); Self-Statements Related to Public Speaking (SSPS, Hofmann & DiBartolo, 2000)

Table 6
Internal consistency of Total Scores and LSAS-CA-SR subscales

LSAS-CA-SR scores	Total Sample (n= 422) (Present study)	Total Sample (n= 154) (Masia et al.)
Total Score*	0.94	0.97
LMT*	0.91	0.95
LMS*	0.85	0.92
LMA*	0.84	0.91
LET*	0.89	0.95
LES*	0.84	0.91
LEA*	0.82	0.90

* (Description in Table 3)

Table 7
Means (standard deviations) in fear and avoidance scales by gender and age

	Age								
	10	11	12	13	14	15	16	17	Total
Male(1)	11.52 (11.41)	16.27 (13.87)	16.81 (11.29)	13.56 (9.25)	10.74 (8.44)	8.77 (5.89)	11.52 (8.65)	9.69 (8.87)	12.53* (10.31)
Female(1)	12.68 (7.99)	12.50 (11.24)	18.68 (11.75)	13.79 (7.89)	14.96 (9.53)	17.42 (10.02)	13.45 (12.40)	14.87 (15.29)	14.72* (10.99)
Male(2)	10.67 (12.29)	19.97 (14.51)	16.06 (11.99)	18.82 (13.64)	12.71 (12.62)	10.73 (7.24)	12.95 (7.26)	13.15 (10.09)	14.50 (11.97)
Female(2)	11.73 (8.48)	14.71 (12.34)	16.32 (10.60)	15.36 (9.73)	16.56 (9.86)	20.10 (11.12)	14.64 (13.17)	14.56 (11.28)	15.53 (11.05)

Note: * (F= 5.518, gl= 1, 406, p= .019); (1) LMT (Total fear subscale); (2) LET (Total avoidance subscale)

relation subscale, and avoidance, from the performance subscale, because both subscales assessed different aspects of social anxiety. These results are consistent with others obtained by Heimberg, Horner, and Juster (1999) using a self-report adult version, and by Zubeidat, Salinas, and Sierra (2007) with a sample of adolescent Spanish-speaking populations (range: 13-18 years old) for the original adult version of the LSAS (Liebowitz, 1987).

The Spanish version of LSAS-CA-SR presents a good concurrent validity. The correlations between the total LSAS-CA-SR scores and other instruments of social anxiety were from moderate to high (.40-.73). Good results were obtained with respect to the association between LSAS-CA-SR subscales and the other tests administered (.50-.77). The highest association was between the fear subscale and SPAI-C (.77), the only specific test for children and adolescents administered in this study.

The correlations between LSAS-CA-SR and SAS-A ranged between .43 and .64 and the correlation between LSAS-CA-SR and the relationship fear scale was high, .66, while the correlation of LSAS-CA-SR with the performance fear subscale was .59.

When we analyzed the correlations with instruments of relationship situations, the association obtained was higher (.54) than that of relationships with instruments of performance situations (.44). However, we found contradictory results for the SSPS scale. This questionnaire assesses the anxiety experienced in performance situations. The expectation was to find high correlations with the performance subscales of LSAS-CA-SR, but the association of SPS with avoidance on the performance situation subscale was lower (.48) than avoidance on the relationship situation subscale (.54).

In relation to the association between SIAS and the fear subscales (relationship and avoidance), the correlations were equal (.65). The correlation was lowest between LSAS-CA-SR and SSPS (.28-.41). There are two explanations for this result: SSPS is a cognitive measure, while LSAS-CA-SR is a general measure. Furthermore, self-observation in these ages may be affected by the cognitive development of the children.

The internal consistency was similar to that obtained by Masia-Warner et al. (2003) in a clinical interview version applied to children and adolescents. It also resembles the results obtained by a self-report adult version (Fresco et al., 2001; Zubeidat et al., 2007). The alpha coefficient of the LSAS-CA-SR total score was .94, slightly lower than that found in an American population. In relation to instruments of fear and avoidance, values of internal consistency (range: .82 to .91) were similar to those shown by the other instruments tested (for example, subscales of SAS-A ranged between .80 and .94; Olivares et al., 2002), and subscales of SPAI ranged between .77 and .93 (Olivares, García-López, Hidalgo,

Turner, & Beidel, 1999). Thus, the results for internal consistency of the self-report version LSAS-CA-SR were coherent with others found in different self-report instruments of social anxiety.

Several studies have shown that there is an increase in the prevalence of social phobia according to age, (e.g., Olivares, Piqueras, & Rosa, 2006), with its highest frequency in mid-adolescence. The early results of LSAS-CA-SR were in coherence with this trend (Olivares et al., 2002), although the age was not significantly different in the age groups studied (range: 10-17 years old). On the other hand girls scored higher in social anxiety than boys in all studies reviewed (Beidel & Turner, 2005). It seems that gender had an influence on fear scores in our study; i.e., girls showed higher anxiety in the different social situations of the LSAS-CA-SR scale, but we can not conclude that there is a direct influence of the gender variable in the variance of fear scores because the effect size is lower in our study.

This study presents promising results and good psychometric properties of the self-report LSAS-CA-SR in the adapted version in Spanish in the age range studied. This is a point in favour of the transcultural validity of social anxiety. Further validation studies will be necessary to confirm these findings without the limitations of the present study: it will be necessary to analyze temporal reliability as well as diagnostic and discriminative capacity by increasing the sample size and testing different populations.

There are some limitations of this study that are associated with the methodology and design: the lack of clinical sample and the measurement. Our sample is not representative for the whole Spanish adolescent population, a fact which constitutes an obstacle in generalizing the results (to clinical adolescent populations and with occupations other than studying). As for the measurement limitations, it is possible that youngsters may understand the concept of fear in the LSAS-CA better than the concept of avoidance, thus responding differently when evaluating their intensity, in spite of our efforts to control this variable. It would also have been useful to include some other measure of the anxiety reported by the participans, such as the parents' evaluation of this construct on their children.

Finally, the clinical relevance of LSAS-CA-SR is explained by the good psychometric properties in this population. Relevant information is obtained about representative situations of relation and performance, administration of the test is easy and correction and interpretation are carried out quickly. Furthermore, the psychometric properties shown open the way to new studies to research therapeutic change and to determine the cut-off score that increases the probability of rejecting false positives regarding construct, in the detection tasks carried out by our research group of a Spanish child and adolescent community population.

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