

## **The Social Phobia and Anxiety Inventory: Reliability and Validity in an Adolescent Spanish Population**

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*The objective of this study is to examine the factor structure and psychometric properties of the SPAI in a sample of adolescent Spaniards. The results obtained support the use of the correlated two-factor SPAI subscales and indicate high coefficient alpha values for the SPAI subscales. The results provide support for the use of the SPAI in an adolescent population in a non-English-speaking country. Both exploratory and confirmatory factor analyses of the Social Phobia subscale showed a four-factor structure, instead of a five-factor dimension, as suggested by previous studies. Effects for gender and age and gender interaction were found. Limitations and suggestions for future research are discussed.*

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**KEY WORDS:** assessment; factor structure; reliability; social phobia; validity.

### **INTRODUCTION**

Social phobia is one of the three most common mental disorders in normal populations (Davidson, Hughes, George, & Blazer, 1993). Several

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studies have also indicated a strong connection to other anxiety and personality disorders (Hazen & Stein, 1995) as well as high rates of suicide and economic dependence on family members (Schneier, Johnson, Horning, Liebowitz, & Weissman, 1992). Different studies have showed that the average age of onset is midadolescence (Thyer, Parrish, Curtis, Nesse, & Cameron, 1985; Schneier *et al.*, 1992), creating the possibility for severe consequences in adolescents in three areas. First, several studies have indicated consequences in academic achievement due to these subjects' lack of participation in class, their reluctance to present projects in public, and their tendency to avoid asking questions concerning doubts to the teacher in the classroom or even later in private (Beidel, 1991; Francis & Radka, 1995; Last & Strauss, 1990; Lawrence & Bennet, 1992). Second, the personal development of the subjects, as a result of the avoidance of social situations, causes a lack of social reinforcement, which can provoke states of depression (Francis, Last, & Strauss, 1992; Vaughn & Lancelotta, 1990). Finally, in the aspect of health, several studies have found that as a consequence of their lack of social skills, there is a higher risk of using legal and illegal drugs (Clark & Kirisci, 1996; Clark & Sayette, 1993).

To date, in spite of the numerous negative consequences caused, there are few effective instruments designed to assess social phobia in adolescents and none of them can be attributed to a Spanish author. An early attempt was the *Inventory of Fears for Children and Adolescents* (Ollendik, 1983), which included one subscale that described social situations. Nonetheless, this subscale also contained items that evaluated other dimensions, a reason other authors have pointed out that this inventory does not offer a measure of social anxiety (Francis & Radka, 1995; Gullone & King, 1992). Finally, La Greca and Lopez (1998) have developed *The Social Anxiety Scale for Adolescents* (SAS-A). Several studies have found that this scale is a reliable and valid measure of social anxiety in clinical and nonclinical samples (Ginsberg, La Greca, & Silverman, 1998; La Greca & Lopez, 1998; La Greca & Shiloff, 1998).

However, previous to these scales, Clark, Turner *et al.* (1994) had adapted the *Social Phobia and Anxiety Inventory* (SPAI: Turner, Beidel, Dancu, & Stanley, 1989) for adolescent populations. This instrument incorporates that evaluate cognitive, physiological, and conductual dimensions of social phobia and has demonstrated excellent psychometric properties in English-speaking adults and adolescents (Clark *et al.*, 1994; Herbert, Bellack, & Hope, 1991; Turner, Beidel, Stanley, & Dancu, 1989), although at this moment there are no data showing its utility in Spanish.

The SPAI was designed specifically to assess the social anxiety disorder as defined in the DSM-III-R and was systematically constructed following the behavioral-analytic model of Goldfried and D'Zurilla (1969). This in-

strument is a 45-item self-report measure of social phobia and agoraphobia. Thus, the SPAI has two subscales: Social Phobia and Agoraphobia. The rating scale uses a 7-point scoring system, ranging from never (1) to always (7). The Social Phobia subscale contains 32 items, many of which are an average of multiple items from a total of 96 responses. Of the 32, 17 relate to social anxiety in different situations with the presence of (a) strangers, (b) authority figures, (c) members of the opposite sex, and (d) people in general. The mean rating for each item that requires multiple ratings is obtained by averaging the ratings for that item. The score is calculated by summing the rating on all 32 items and subtracting 32 from the total. The maximum score on this subscale is 192.

The Agoraphobia subscale score is obtained by summing the 13 subscale items and subtracting 13. The maximum score on this subscale is 78. A Difference score is derived by subtracting the Agoraphobia subscale from the Social Phobia subscale and is designed as a control for social anxiety attributable to agoraphobia.

Although the SPAI was designed for an adult population, data do exist to support its use in adolescent populations. Nonetheless, up to the moment investigations have been focused on North American populations, leaving unknown its efficiency in other languages and/or cultures.

The objective of this study was to determine the reliability and validity of the SPAI for Spanish language and an adolescent populations. Confirmatory factor analysis was used to examine the oblique two-factor model of the SPAI. Second, we used both exploratory and confirmatory factor analysis to replicate the factor structure of the 32-item Social Phobia. Third, we examined the adequacy of the internal consistency indexes of the SPAI subscales.

## METHOD

### Subjects

The initial sample consisted of 3440 students in the 9th and 10th grades,<sup>5</sup> attending 3 private and 10 public high schools in different cities of a medium county in Spain. Six subjects (0.2%) chose not to participate in the study and 274 were excluded due to incompleting questionnaire or age above 17 years. The final sample of 3160 subjects was composed by 1534 boys (48.54%) and 1626 girls (51.46%). The sample ranged in age from 14 to 17 years ( $M = 15.236$  years,  $SD = 0.911$  years). Due to the racial and ethnic

<sup>5</sup>For Spanish readers, the grades were FP, 3° and 4° ESO, or equivalent, 1° and 2° BUP.

homogeneity of the county, the majority of the students were Caucasian (99%), although they represented a wide range of socioeconomic levels.

### Procedure

During 1 week, eight research assistants administered the questionnaire in 98 classrooms in several cities. In each classroom, students completed the self-report measure as a group. Participation was strictly voluntary and no indication of the objective of completing the questionnaire was given before having the students fill it out. Rejection rates were minimal, approximately 0.2%. Instructions regarding the completion of the questionnaire were then provided, after which students were allowed to complete it at their own pace. Research assistants circulated among the students during the test session and provided individualized help to any student who experienced difficulty. Completion of SPAI took approximately 40 min. Only then were students told that they were participating in a study about interpersonal relationships in adolescence. Those students interested in knowing their scores or more data were given the opportunity to give us their names, and in the second phase, they were informed about the significance of their respective scores.

## RESULTS

### Descriptive Characteristics of SPAI for Adolescents

Two-way analyses of variance for the four age groups and gender found a nonsignificant main effect for age on the SPAI Difference score [ $F(3,3152) = 1.02, p = .383$ ] and the Social Phobia subscale [ $F(3,3152) =$

**Table I.** Means and Standard Deviations for SPAI Subscales

	Social phobia	Agoraphobia	Difference	<i>N</i>
Gender				
Boys	54.20 (28.14)	11.46 (9.60)	42.74 (23.58)	1534
Girls	64.63 (31.36)	15.22 (11.23)	49.41 (26.36)	1626
Age				
14	61.35 (30.41)	14.10 (11.10)	47.25 (24.81)	716
15	59.23 (29.87)	12.65 (10.19)	46.58 (25.11)	1293
16	58.33 (29.64)	12.98 (10.62)	45.35 (24.88)	840
17	58.76 (31.62)	13.63 (10.80)	45.13 (27.04)	311

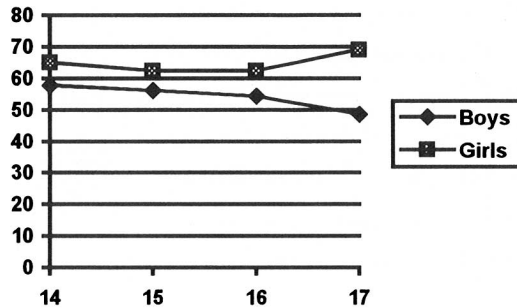


Fig. 1. Distribution of means for the Social Phobia subscale.

1.445,  $p = .228$ ] but a significant effect for the SPAI Agoraphobia subscale [ $F(3,3152) = 3.282, p = .02$ ]. There were main effects for gender on the SAI Difference score [ $F(1,3152) = 42.99, p = .000$ ], the Social Phobia subscale [ $F(1,3152) = 74.2, p = .000$ ], and the SPAI Agoraphobia subscale [ $F(1,3152) = 78.2, p = .000$ ], with females scoring significantly higher than male adolescents (see Table I). The two-way interaction was also significant for the SPAI Difference score [ $F(3,3152) = 3.6, p = .013$ ], the Social Phobia subscale [ $F(3,3152) = 4.96, p = .002$ ], and the SPAI Agoraphobia subscale [ $F(3,3152) = 3.99, p = .008$ ], showing different patterns with respect to age: a continuous decrease in scores for males and an increase in scores for females at 16 or 17 years (see Figs. 1, 2, and 3).

### Confirmatory Factor Analysis of the 45 SPAI Items

Three alternative models were evaluated: (a) the null model or independence model; (b) a one-factor model, in which all 45 SPAI items were

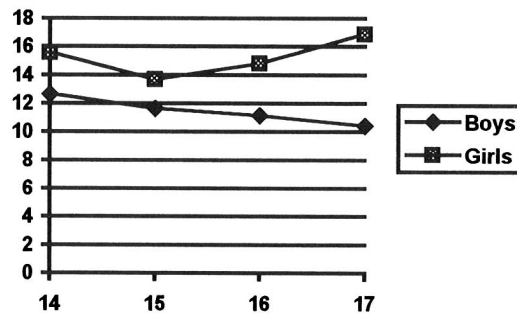


Fig. 2. Distribution of means for the Agoraphobia subscale.

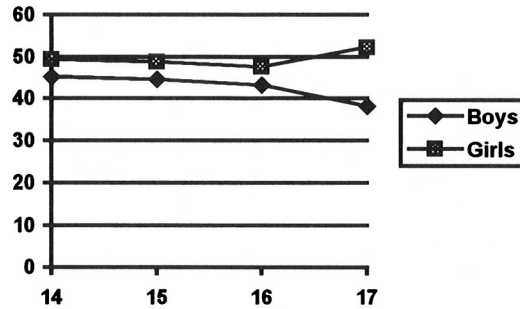


Fig. 3. Distribution of means for the Difference score.

forced to load on a general phobic factor; and (c) a two-factor (oblique) model of the SPAI (the 32-item SPAI-SP and the 13-item SPAI-AGO dimensions). Because the responses on the SPAI items were nonnormal, the unweighted least-squares (ULS) algorithm was used for all parameter estimations. Also, due to the fact that the chi-square test statistic is significantly affected by factors such as sample size, we used three practical fit indexes to evaluate the adequacy of the model tested: (1) a goodness-of-fit index (GFI) of .90 or above, (2) an adjusted goodness-of-fit index (AGFI) of .85 or above, and (3) a root mean-square residual (RSMR) value less than .10.

Models were evaluated using the statistical program LISREL 8.12 (Jöreskog and Sörbom, 1993). Results (see Table II) showed that the probability levels of all chi-square statistics were less than .001, indicating a rather poor absolute fit. The most likely cause for this is the large sample size. In large samples, the chi-square statistic is very powerful, and even quite a good model fit will produce significant differences. The best relative fit of the three models was found for the oblique two-factor model, with a GFI = .98, an AGFI = .98, and a RSMR = .049. The chi-square measure of the goodness of fit of 7817.61 with 944 df was significant ( $p = .000$ ), indicating a discrepancy between the model and the data. Although the chi-square

Table II. Single Models

Model	$\chi^2$	df	$p$	RMSR	GFI	AGFI
Null	373,256.26	990	0.00			
One factor	12,157.26	945	0.00	0.061	0.97	0.97
Two factor	7,817.61	944	0.00	0.049	0.98	0.98

Note. RMSR, root mean-square residual; GFI, goodness-of-fit index; AGFI, adjusted goodness-of-fit index.

test statistic was significant for the two-factor oblique model, this model was preferred to the null model.

### Factor Structure of the Social Phobia Items

The factor structure of the 32-item Social Phobia subscale was examined using confirmatory and exploratory factor analyses. The total sample was randomly split into two independent data sets. Subsample 1 consisted of 752 men and 786 women between 14 and 17 years of age ( $M = 15.241$  years,  $SD = 0.904$  years) and subsample 2 included 782 men and 840 women; the mean age was 15.322 years ( $SD = 0.919$  years). The subsample 1 was used to evaluate the fit of prior models and also to explore other potential factor structures of the SP subscale. Subsample 2 was used to conduct confirmatory factor analyses of the SP items and to cross-validate the derived models.

#### *Confirmatory Factor Analyses—Subsample 1*

We submitted the five factors model reported by Osman, Barrios, Ankes, and Osman (1995) and Turner, Stanley, Beidel, and Bond (1989) to analyses. Two models were tested: (a) a five-factor model A, in which each of the SP items was constrained to load on only one factor, and (b) a five-factor model B, in which four of the SP items (Nos. 3, 4, 9, and 10) were allowed to load on two different factors. In order to make the results comparable, we retained for the analyses the same 30 items used by Osman *et al.* (1995), then items 21 and 29 were excluded from the analyses.

The results showed that the five-factor model A ( $GFI = 0.91$ ,  $AGFI = 0.89$ ,  $RMSR = 0.14$ ) and the five-factor model B ( $GFI = 0.91$ ,  $AGFI = 0.89$ ,  $RMSR = 0.14$ ) did not fit the data well. The results differ from the results reported by Osman *et al.* (1995), where the five-factor model A and B fit well.

#### *Exploratory Principal-Components Analysis—Subsample 1*

Given that the five-factor model was not replicated, we explore other potential dimensions of the Social Phobia subscale.

The factor structure of the 32-item Social Phobia subscale was examined using exploratory principal-components analysis with varimax rotation. A four-factor solution (eigenvalue greater than 1.0) was suggested for the

Social Phobia items (see Table III). Only items that loaded .40 or greater on a factor were retained within a factor. All items reached this criterion for retention on the extracted factors. The four factors accounted for 52.7% of the variance. Our results differ from the five factors reported by Turner *et al.* (1989) and Osman *et al.* (1995). Extraction of five- and six-factor solutions did not yield meaningful interpretations.

#### *Confirmatory Factor Analysis of the Social Phobia Items—Subsample 2*

We submitted three models: (a) a one-factor model, in which all 32 Social Phobia items were forced to load on a single factor of social phobia; (b) a four-factor oblique model A, in which each one of the Social Phobia items constrained to load on only one factor of social phobia; and (c) a four-factor oblique model B, in which three of the Social Phobia items (Nos. 7, 9, and 10) were allowed to load on two different factors (see items underlined in Table III). Results showed that the four-factor model A (GFI = .99, AGFI = .99, RMSR = .042) and the four-factor model B (GFI = 0.99, AGFI = 0.99, RMSR = 0.042) fit the data well. Also, the one-factor model (GFI = .98, AGFI = .98, RMSR = .059) fit well in this sample. Parameter estimates for the four-factor model are given in Table IV. As exploratory principal-component analysis, confirmatory analysis indicated the adequacy of the four-factor solution for the Social Phobia subscale. No item loaded on two factors.

**Table III.** Principal-Components Analysis Social Phobia Subscale Items—Subsample 1

Factor	Number of items	Item Nos.	Loading (range)	Variance (%)	$\alpha^a$
Social interactions (Eigenvalue = 6.542)	15	<u>9</u> , 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	.42–.68	20.4	.935
Cognitive and somatic symptoms (Eigenvalue = 4.219)	7	26, 27, 28, 29, 30, 31, 32	.41–.71	13.2	.877
Focus of attention (Eigenvalue = 3.965)	9	1,2,3,4,5,6, <u>7</u> , 9, <u>10</u>	.43–.55	13.4	.805 <sup>b</sup>
Avoidance and escape (Eigenvalue = 2.129)	4	<u>7</u> , 8, <u>24</u> , 25	.50–.67	6.7	.775

*Note.* Items underlined loaded on two factors.

<sup>a</sup>Cronbach's coefficients alpha for the Social Phobia subscales.

<sup>b</sup>Coefficient for item Nos. 1–6.



Table IV. Confirmatory Factor Analysis of the Social Phobia Subscale Items

Item no.	Social interactions	Cognitive and somatic	Focus of attention	Avoidance and escape
I1	.00	.00	<b>.59</b>	.00
I2	.00	.00	<b>.64</b>	.00
I3	.00	.00	<b>.66</b>	.00
I4	.00	.00	<b>.63</b>	.00
I5	.00	.00	<b>.70</b>	.00
I6	.00	.00	<b>.57</b>	.00
I7	.00	.00	.00	<b>.62</b>
I8	.00	.00	.00	<b>.54</b>
I9	<b>.72</b>	.00	.00	.00
I10	<b>.77</b>	.00	.00	.00
I11	<b>.73</b>	.00	.00	.00
I12	<b>.78</b>	.00	.00	.00
I13	<b>.70</b>	.00	.00	.00
I14	<b>.67</b>	.00	.00	.00
I15	<b>.61</b>	.00	.00	.00
I16	<b>.73</b>	.00	.00	.00
I17	<b>.61</b>	.00	.00	.00
I18	<b>.76</b>	.00	.00	.00
I19	<b>.80</b>	.00	.00	.00
I20	<b>.57</b>	.00	.00	.00
I21	<b>.52</b>	.00	.00	.00
I22	<b>.81</b>	.00	.00	.00
I23	<b>.60</b>	.00	.00	.00
I24	.00	.00	.00	<b>.81</b>
I25	.00	.00	.00	<b>.67</b>
I26	.00	<b>.76</b>	.00	.00
I27	.00	<b>.79</b>	.00	.00
I28	.00	<b>.64</b>	.00	.00
I29	.00	<b>.59</b>	.00	.00
I30	.00	<b>.81</b>	.00	.00
I31	.00	<b>.69</b>	.00	.00
I32	.00	<b>.75</b>	.00	.00

### Internal Consistency

Intrascale reliabilities were calculated by Cronbach (1951) alpha reliability estimates. For the SPAI Social Phobia subscale, the reliability estimate was .955. Coefficient alpha reliability values for the factor subscales ranged from .775 to .935 (see Table III). For the SPAI Agoraphobia subscale, the reliability was  $\alpha = .835$ . For the SPAI Difference score, the reliability was  $\alpha = .955$ . The SPAI Social Phobia subscale correlated highly with the SPAI Difference score ( $r = .942, p = .000$ ). The SPAI Social Phobia subscale also correlated significantly with the Agoraphobia subscale ( $r = .604, p = .000$ ). Finally, the correlation between the Agoraphobia subscale and the SPAI Difference was .302 ( $p = .000$ ).

## DISCUSSION

The present study does demonstrate that the SPAI is a reliable and valid measure of social anxiety for Spanish adolescents. Dealing with descriptive characteristics, one-way analysis of variance that compared gender on the three SPAI measures (Social Phobia, Agoraphobia, and Difference) showed significant differences ( $p < .000$ ), which contrast with other studies (Herbert *et al.*, 1991; Osman *et al.*, 1995, 1996) but consistent with Clark *et al.*'s study using an adolescent sample. Significant age differences were also obtained on the Agoraphobia subscale but not on the Social Phobia subscale and Difference score. However, the two-way analysis of variance revealed two different tendencies: in older males lower scores were obtained for all SPAI measures, while for females there was a decrease in scores at 15 years of age, followed by a gradual increase beginning at 16 years of age on the Agoraphobia and Social Phobia subscales but not on the Difference score. These data suggest the necessity for different cutoffs according to age and sex for each of the SPAI measures. Nevertheless, these differences may be minimal due to the large sample size, which produce significant effects even with small differences among the groups compared.

As for the factor structure of the SPAI, confirmatory factor analysis endorsed the adequacy of the two-factor dimension. Specifically, the protocol fit indexes of the two-factor model, compared with the one-factor or null model, provided strong support for the two-factor oblique model and indicate the effectiveness of the SPAI as a measure of adolescent's social anxiety. These data are consistent with previous studies (Clark *et al.*, 1994; Osman *et al.*, 1995, 1996). Furthermore, this investigation evaluated the five-factor structure of the 32-item Social Phobia subscale reported by Turner, Stanley, Beidel, and Bond (1989). Both exploratory and confirmatory factor analysis revealed that this scale differed from previously reported, findings suggesting that a four-factor structure might be more accurate. These results contrast with those obtained by Osman *et al.* (1995), who found data indicating that the five-factor structure of the Social Phobia subscale for their sample size ( $N = 210$ ) was appropriate.

Finally, this study has presented data on the internal consistency of the SPAI measures, showing satisfactory coefficient alpha values. The findings of this investigation are the first to complement data provided by Clark *et al.* (1994) and indicate that the SPAI scores may be appropriate for use in adolescent samples.

Some limitations of the present investigation should be noted. First, the generalization of the findings for clinic samples is limited by the nonclinical nature of this sample. Further investigations with different clinical and community groups will be needed to extend the findings of the current

study. Second, the test–retest reliability of this instrument with a Spanish population must be determined. And third, the construct validity of the SPAI with other measures of social anxiety must be evaluated for this population. Despite these limitations, results of this study suggest that the SPAI has adequate psychometric characteristics in adolescent populations.

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