

## Screening Utility of the Social Anxiety Screening Scale in Spanish Speaking Adolescents

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The aim of this study was to analyse the screening utility of the Social Anxiety Screening Scale (SASS/EDAS) in a sample of 227 adolescents with social anxiety disorder and 156 without it (14-17 years). Results showed that the EDAS subscales (Avoidance, Distress and Interference) scores were reliable in terms of internal consistency ( $\alpha > .80$ ). All the subscales discriminated between adolescents with and without the disorder. They also showed a positive and significant correlation with other empirically validated measures of social anxiety. The three subscales indicated relevant sensitivity (69.16-84.14%), specificity (63.46-66.03%) and areas under the curve (.74-.81%). Binary logistic regression analyses indicated the adequate predictive utility of EDAS subscales, with the Distress subscale as the best diagnostic predictor. The data provide empirical evidence of the usefulness of EDAS as a screener for adolescent social anxiety disorder in terms of reliability, convergent and discriminant validity, diagnostic accuracy and clinical usefulness.

*Keywords: social phobia, social anxiety, adolescence, assessment, screening.*

El objetivo de este estudio fue analizar la precisión diagnóstica y utilidad clínica de la Escala para la detección de ansiedad social (EDAS) en una muestra de 227 adolescentes con el trastorno de ansiedad social y 156 sin el trastorno (14-17 años). Los resultados muestran que las puntuaciones en las subescalas de la EDAS (Evitación, Malestar e Interferencia) fueron fiables en términos de consistencia interna ( $\alpha > .80$ ). Todas las subescalas discriminaron entre adolescentes con y sin el trastorno. También correlacionaron positiva y significativamente con otras medidas de ansiedad social validadas empíricamente. Las tres subescalas indicaron una sensibilidad (69.16-84.14%), especificidad (63.46-66.03%) y área bajo la curva (.74-.81%) adecuadas. Los análisis de regresión logística binaria determinaron la utilidad predictiva de las tres subescalas de la EDAS, si bien la subescala Malestar se mostró como el mejor predictor del diagnóstico. Los datos aportan evidencia empírica de la utilidad de la EDAS como herramienta de detección para el trastorno de ansiedad social en la adolescencia en términos de fiabilidad, validez convergente y discriminante, precisión diagnóstica y utilidad clínica.

*Palabras clave: fobia social, ansiedad social, adolescencia, evaluación, detección.*

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Social anxiety disorder (SAD), or social phobia, is characterised by a marked and persistent fear of one or more social or performance situations in which the person is exposed to possible scrutiny or negative assessment by others (American Psychiatric Association, 2000). SAD has been demonstrated as a valid diagnosis in children and adolescents and is considered as one of the three most common disorders during this stage of development and across different cultures (Bogels et al., 2010). The presence of subclinical or high social anxiety is also frequent in community samples (Inglés et al., 2010). It has an early onset and can become chronic, if not treated (Olivares, Piqueras, & Rosa, 2006). The negative repercussions on the personal development and quality of life of adolescents have been broadly reported (Olivares, 2009; Piqueras, Olivares, & Lopez-Pina, 2008; Simon & Bogels, 2009). Consequently, all these characteristics highlight the importance of an early screening strategy of SAD in childhood and adolescence in order to minimise its effects both at the time and in the future development of adolescents through intervention programs (Olivares, Vera-Villaruel et al., 2009; Piqueras et al., 2008; Simon & Bogels, 2009).

In order to develop screening strategies and early interventions it is necessary to have valid and reliable self-report questionnaires. Due to the subjective and internalizing nature of social anxiety, the self-report method is commonly used for assessments (Simon & Bogels, 2009). Self-report assessments are crucial in obtaining detailed information and are cost- and time-effective (Anderson, Jordan, Smith, & Inderbitzen-Nolan, 2009). There are two empirically and widely validated self-report measures to assess SAD symptomatology in childhood and adolescence: the Social Phobia and Anxiety Inventories (SPAI; Turner, Beidel, Dancu, & Stanley, 1989; the Brief Form, SPAI-B; García-López, Hidalgo, Beidel, Olivares, & Turner, 2008; and the version for Children, SPAI-C; Beidel, Turner, & Morris, 1995) and the Social Anxiety Scales (for Adolescents, SAS-A; La Greca & Lopez, 1998 and for Children-Revised, SASC-R; La Greca & Stone, 1993). Other tests, originally developed for their use with adults, such as the Social Interaction Anxiety Scale and Social Phobia Scale (SIAS y SPS; Mattick & Clarke, 1998), Social Phobia Inventory (SPIN; Connor et al., 2000), the Liebowitz Anxiety Scale (LSAS; Liebowitz, 1987) and the Social Phobia Screening Questionnaire for Children and Adolescents (SPSQ-C; Gren-Landell et al., 2009) have also proved to be valid and reliable for adolescents (e.g., García-López, Bermejo, & Hidalgo, 2010; Olivares, Sánchez-García, & López-Pina, 2009; Olivares, Sánchez-García, López-Pina, & Rosa-Alcázar, 2010). Furthermore, other broad-band self-reports of anxiety, including subscales for assessing SAD, have also been used to assess childhood and adolescent SAD (Birmaher et al., 1997; March, Parker, Sullivan, Stallings, & Conners, 1997; Spence, 1998).

Nevertheless, different authors indicate that further support is necessary for the validation of specific measures of SAD in children and adolescents (Anderson et al., 2009; Gren-Landell et al., 2009; Olivares, 2009).

Despite the use of well-established international instruments allows comparisons between studies and cultures, one criticism that can be made about such a common procedure is that in many cases the questionnaires of exclusively English speaking origin do not take into account the possible cross-cultural differences (Caballo et al., 2010). Thus, the need for a brief and specific screening questionnaire for the broad linguistic context of Spanish-speaking adolescents, which was based on the Diagnostic and Statistical Manual of Mental Disorder-Fourth Edition (DSM-IV; American Psychiatric Association, 2000), brought about the development of the Social Anxiety Screening Scale (Escala para la Detección de Ansiedad Social; EDAS) by Olivares and García-López in 1998. This development aimed not only to address the lack of specific SAD instruments, considering possible cross-cultural differences that may affect translations and adaptations of English questionnaires into Spanish (Caballo et al., 2010), but also the lack of attention to the DSM-IV criteria of interference for the diagnosis of SAD (American Psychiatric Association, 2000).

The EDAS was the first empirically validated instrument for assessing social anxiety in Spanish-speaking adolescent population (Olivares & García-López, 1998; Olivares, Piqueras, & García-López, 2005; Olivares, Piqueras, & Sánchez-García, 2004). The bank of items was directly and specifically taken from the DSM-IV diagnostic criteria for SAD (American Psychiatric Association, 2000), corresponding to the tripartite model of anxiety proposed by Lang in 1968. The questionnaire was finally made up of 10 items (see in the appendix section). The first 2, which are qualitative and have a dichotomous format, assess the cognitive component of SAD (criterion A; DSM-IV-TR) and are not used for obtaining subscales scores. The remaining 8 items, which contain social situations commonly feared by adolescents with SAD, have to be rated through a 5-point Likert-type scale in accordance with the level of avoidance, nervousness/overactivation—distress—(criteria B-D; DSM-IV) and the intensity of interference that social anxiety may generate in the subject (criterion E; DSM-IV).

Previous studies have shown that this measure has a three-factor structure: Avoidance, Distress and Interference (Piqueras, Olivares, Hidalgo, Vera-Villaruel, & Marzo, 2011; Piqueras, Olivares, Vera-Villaruel, Marzo, & Kuhne, 2012; Vera-Villaruel, et al., 2007). All these studies have indicated that the alpha values of internal consistency of the three subscales are above .76; the scores are temporally reliable (.48-.60) and are associated significantly with other well-established measures, such as the SPAI and the SAS-A, with values between .50 and .76 (Olivares et al., 2004; Olivares et al., 2005; Piqueras, Olivares, Hidalgo et al., 2011;

Piqueras, Olivares, Vera-Villarroel et al., 2012; Vera-Villarroel et al., 2007). These same studies have indicated the following as the main potential applications of this test: (a) screening measure for identifying adolescents with social anxiety problems; (b) a counselling tool for adolescents; (c) to help select the target areas for treatment and to be useful for assessing the therapeutic change in treatment or prevention programs in a wide variety of clinical, educational and research contexts. Furthermore, the validation of this instrument might have potential interest to researchers and clinicians focused on USA Spanish-speaking population or from Latin America. According to the U.S. Census Bureau Latinos represent 15% of the population from USA, being Spanish the second most spoken language in this country and the second most spoken language in the world by the number of people who are native speakers.

Concerning psychometric properties, several studies have indicated that EDAS shows good psychometric properties in community samples. However the screening utility of the measure has not been empirically examined. There is no data available for samples with SAD diagnosis nor evidence of the screening accuracy and utility of the test. Therefore, the main objective of this study was to obtain estimations of the reliability and validity of EDAS as a screening tool in a community sample of adolescent, of whom some have SAD diagnoses. Firstly, the reliability of scores on the EDAS subscales was evaluated (i.e., internal consistency), where Cronbach's alpha values were expected to be higher than .80 in all cases. Secondly, convergent-divergent validity of the EDAS subscales was investigated, with the expectation to find high correlations between the EDAS subscales and other empirically validated social anxiety measures and a low correlation with other clinically-relevant related constructs. Third, the discriminant validity of the EDAS subscales was evaluated, predicting group differences between the sample of adolescents with SAD and the non-SAD group on all comprised measures. Fourth, the diagnostic accuracy of the EDAS scales was analysed using ROCs analysis, where the subscales were expected to present areas under the curve close to .80 and to be sufficiently sensitive and specific in the diagnostic classification of SAD. Finally, binary logistic regression analyses were carried out in order to evaluate the predictive usefulness of the EDAS scales, hypothesizing that the subscales would prove to be significant in the diagnostic prediction of SAD.

## Method

### Participants

Participants of this study came from a wide school-based sample of 1489 adolescents, from secondary

educational centers (60 participating classes) from the Region of Murcia and the province of Alicante in the Comunidad Valenciana (753 males, 50.6%; 736 females, 49.4%), aged between 14 and 17 years old ( $M = 15.15$ ,  $ST = 0.95$ ). Convenience sampling was used. The 13 participating centers belonged to 6 cities of different sizes and were situated in both rural and urban areas; 11 of them were state centers and only two were semi-private. Consequently, the socio-economic status of the sample was broad and representative of the community.

First of all, the objectives of the research were presented to the heads of the participating centres. After explaining the procedure, the EDAS and two of the well-established screening tests for adolescent SAD: the SPAI (Turner et al., 1989) and the SAS-A (La Greca & Lopez, 1998) were conducted. 393 adolescents who scored equal to or above a cut-off of 70 on the SPAI-SP or 53 on the total score of the SAS-A (233; 59.3%) or both (160; 40.7%) (cut-off scores established by Olivares et al., 2002) went on to the phase of the diagnosis evaluation (between 15-30 days after the screening assessment). In this phase, trained doctoral students in Clinical Psychology, under the supervision of licensed psychologist, administered the ADIS-IV-L interview and also conducted the rest of the measures described in the section Instruments (including the EDAS). The assistant researchers had a specific training before administering the measures. Then they provided information when necessary and verified that tests were properly completed by the subjects during the assessment. There were 10 (2.50%) adolescents who declined to participate in the diagnostic evaluation, leaving a sample of 383.

The final sample therefore consisted of 383 (25.72%) adolescents with 180 (47%) males and 203 (53%) females. Age ranged between 14 and 17 years old ( $M = 15.18$ ;  $SD = 0.92$ ). The majority of the students were Caucasian (95.0%) and the remainder were Hispanic-Latinos (5.0%).

Based on the diagnostic interview, adolescents were divided into two groups. 227 (15.24%) adolescents met the diagnostic criteria for SAD, while 156 (10.48%) did not meet them. Groups did not differ regarding age [ $t(381) = 0.728$ ,  $p = .73$ ] or gender ( $\chi^2 = 0.075$ ,  $p = .78$ ) distribution.

### Instruments

#### Self-report measures

*Social Anxiety Screening Scale* (SASS/EDAS; Olivares et al., 2004). Although it was explained in the introduction, a broader description of its construction can be consulted in Olivares et al. (2004) and Piqueras, Olivares, Hidalgo et al. (2011), respectively. A copy of the original instrument in Spanish and English is attached in the Appendix section.

*Social Phobia and Anxiety Inventory* (SPAI; Turner et al., 1989). It assesses cognitive, behavioural, and

physiological responses across several situations. Three scales are included: *Social Phobia* subscale (SPAI-SP), Agoraphobia subscale (SPAI-AG), and the Difference score. Studies with English (Clark et al., 1994; Turner et al., 1989) and Spanish speakers (García-López et al., 2008; García-López, Olivares, Hidalgo, Beidel, & Turner, 2001; Olivares et al., 2002; Olivares, García-López, Hidalgo, Turner, & Beidel, 1999; Olivares et al., 2010) have shown its validity and reliability in adolescents.

*Social Anxiety Scale for Adolescents* (SAS-A; La Greca & Lopez, 1998). It has a three-factor structure: fear of negative evaluation (FNE), social avoidance and distress in new situations (SAD-N) and social avoidance and distress in general situations (SAD-G). It has shown good psychometric properties in English (La Greca & Lopez, 1998; Storch, Masia-Warner, Dent, Roberti, & Fisher, 2004) and Spanish (García-López et al., 2001; Olivares et al., 2002; Olivares, Ruiz et al., 2005) speaking populations.

*Social Interaction Anxiety Scale and Social Phobia Scale* (SIAS y SPS; Mattick & Clarke, 1998). They were designed to evaluate anxiety of social interaction and fear of being observed/scrutinised by others, respectively. Validity and reliability data support its use with English (Carleton et al., 2009) and Spanish (Zubeidat, Salinas, Sierra, & Fernandez-Parra, 2007) speaking populations.

*Inadaptation Scale* (EI; Echeburúa, Corral, & Fernández-Montalvo, 2000). It evaluates the extent to which the participant's current problems affect different areas of daily life: work, social life, free time, relationship with partner and family life. This measure has showed good psychometric properties in Spanish clinical settings (Echeburúa et al., 2000).

*Rosenberg Self-Esteem Scale* (RSES; Rosenberg, 1965). It evaluates the feelings of satisfaction with oneself. The scale presents good psychometric properties in adolescent Spanish populations (Lameiras & Rodriguez, 2003).

*Questionnaire about Interpersonal Difficulties for Adolescents* (QIDA; Inglés, Méndez, & Hidalgo, 2000). It measures adolescents' perceived interpersonal difficulties in a wide range of relationships with people of different ages, genders, levels of authority, and levels of intimacy and in several contexts: school, friends, family and public places. The questionnaire has shown good psychometric properties in Spanish and Chinese samples (Inglés, Marzo, Hidalgo, Zhou, & García-Fernández, 2008; Inglés et al., 2000).

*Rathus Assertiveness Scale* (RAS; Rathus, 1973). It measures assertive behaviour. Its psychometric properties are adequate for English-speaking (Vaal & McCullagh, 1975) and Spanish speaking populations (Salaberria & Echeburua, 1995).

#### *Diagnostic interview*

The *Anxiety Disorder Interview Schedule for DSM-IV, Lifetime Version* (ADIS-IV-L; Di Nardo, Brown, & Barlow,

1994). It is an interview designed to establish a reliable diagnosis of anxiety, mood, substance use, somatoform disorders, etc. It has shown good to excellent reliability for the majority of mental disorders assessed ( $k = .60-.75$ ) (Brown, Di Nardo, Lehman, & Campbell, 2001). In the present study, 20% of the interviews were video-taped for inter-rater agreement and then observed by two independent judges. The inter-rater reliability for the diagnosis of SAD was excellent ( $k = .91$ ). A diagnosis is assigned if a severity rating of 4 or greater is given on a 0-8 rating of distress/impairment. Moreover, when there was doubt about the diagnosis the ultimate decision depended upon the combined opinion of the interviewer and the two first authors of this manuscript.

#### *Data analysis*

The equivalence between groups of sociodemographic variables was analysed by means of independent-sample Student t-tests and  $\chi^2$ . The internal consistency of the subscales was assessed using Cronbach's alpha coefficients. To examine the convergent validity of EDAS subscales and other measures, Pearson's correlation coefficients were calculated. We used the Cohen's criteria (Cohen, 1988) to evaluate the effect sizes (ES) of correlations: small (.20) and large ( $\geq .50$ ) (Cohen, 1988; Lipsey & Wilson, 2001). Fisher's Z tests were carried out to evaluate the significance of the differences between the correlations. Discriminant validity was examined through independent sample t test to calculate the differences between the group with SAD and the group without SAD (the diagnostic group was considered intergroup factor and the scores on the EDAS subscales and the rest of the measures as dependent variables). Cohen's *d* index (standardized mean difference) (Cohen, 1988) was included to assess the effect size: small (.20-.49), medium (.50-.79) and large ( $d \geq .80$ ). In order to determine the accuracy of the scales for correct classification of adolescents with SAD or without SAD, a study of the ROC curve was conducted. Using a procedure presented by Bailey, Chavira, Stein, & Stein (2006), we were able to examine whether the AUCs for specific scales were significantly different from each other. This approach utilizes a critical z ratio to assess whether the difference in the areas under two ROC curves derived from the same set of patients was random or real. Finally, the predictive values of the EDAS subscales on the ADIS-IV diagnosis of SAD were calculated by binary logistic regression analyses (predictive validity).

#### Results

##### *Reliability*

The Cronbach's alpha coefficients for the sample were .80 (Avoidance), .82 (Distress) and .86 (Interference).

*Convergent-divergent validity: association with other social anxiety self-reports*

Results indicated that scores on the EDAS scales were significantly and positively correlated with scores on well-established self-report measures of social anxiety (SIAS, SPAI-SP, SPS and SASA-Total). The effect size was large for Distress and Avoidance subscales ( $r = .66-.82$ ) and medium to large for Interference ( $r = .53-.68$ ). These data are shown in Table 1.

With regard to related constructs measures, all correlations were significant with medium to large effect sizes. Large positive correlation coefficients between EDAS subscales with interpersonal difficulties and inadaptation ( $r = .57-.66$ ) and medium to large negative association between EDAS scales with deficit of assertiveness and low self-esteem ( $r = -.43 / -.65$ ) were found.

Fisher's  $Z$  tests revealed that the differences between the correlations of the EDAS subscales with the remaining measures were not significant ( $p > .05$ ).

*Discriminant validity*

Results indicated that adolescents in the SAD group scored significantly higher on the Avoidance, Distress and Interference subscales compared to adolescents in the non-SAD group (see Table 2). The same significant group effect was found on the other instruments. The effect sizes were large in all cases ( $d \geq .80$ ). Table 2 displays the means and

standard deviations of all measures in the two groups as well as the between-group differences and effect sizes of the comparisons.

*Sensitivity and specificity of the EDAS subscales*

The AUCs of the subscales were high for EDAS Avoidance ( $AUC = .78, SE = .02, p < .01$ ), Distress ( $AUC = .81, SE = .02, p < .01$ ) and Interference ( $AUC = .74, SE = .02, p < .01$ ), suggesting that there is a respective 78%, 81% and 74% probability that an adolescent with SAD will have a higher score on each one of these scales than a non-SAD adolescent. Table 3 shows the sensitivity and specificity likelihood ratio positive ( $LR+$ ) and likelihood ratio negative ( $LR-$ ) for different EDAS subscales.

The comparisons among AUCs for the three EDAS subscales did not find a significant difference between Avoidance and Distress (Difference between areas = .02,  $SD = .02; z = 1.24; p = .21$ ) or between Avoidance and Interference (Difference between areas = .04,  $SD = .02; z = 1.76; p = .08$ ). Nevertheless, the Distress scale was significantly different from the Interference subscale (Difference between areas = .0632,  $SD = .02; z = 2.863; p < .01$ )

Cut-off scores were selected to provide the best balance between sensitivity and specificity for each measure. Therefore, the EDAS-Avoidance cut-off score of 9 showed

Table 1

*Correlations among EDAS subscales and other SAD self-report measures (N = 383)*

MEASURES	EDAS		
	AVOIDANCE	DISTRESS	INTERFERENCE
SPAI-SP	.78**	.79**	.63**
SPAI-AG	.68**	.67**	.68**
SASA FNE	.65**	.66**	.53**
SASA SAD-N	.74**	.76**	.58**
SASA SAD-G	.71**	.73**	.59**
SASA TOTAL	.76**	.78**	.61**
SPS	.76**	.79**	.65**
SIAS	.79**	.82**	.67**
RSES	-.47**	-.51**	-.43**
EI	.59**	.60**	.61**
QIDA	.61**	.66**	.57**
RAS	-.63**	-.65**	-.51**

*Note.* SPAI: Social Phobia and Anxiety Inventory; SPAI-SP: Social phobia subscale; SPAI-AG: agoraphobia subscale; SASA: Social Anxiety Scale for Adolescents; SASA/SAD-N: Avoidance and Distress in new situations subscale; SASA/FNE: fear of negative evaluation subscale; SASA/SAD-G: Avoidance and Distress in general situations subscale; SIAS: Social Interaction Anxiety Scale; SPS: Social Phobia Scale; EI: Inadaptation Scale; RSES: Rosenberg Self Esteem Scale; RAS: Rathus Assertiveness Scale; QIDA: Questionnaire about Interpersonal Difficulties for Adolescents.

Table 2

Means and standard deviations for the self-report measures by diagnostic group and between-group differences

	ADIS-IV-L Diagnosis				
	Social anxiety disorder	Non social anxiety disorder	CE	t(381)	Effect size (Cohen's <i>d</i> )
EDAS-AVOIDANCE	13.18 (6.21)	7.08 (4.67)		-10.40**	1.11
EDAS-DISTRESS	14.50 (6.21)	7.56 (5.09)		-11.46**	1.21
EDAS-INTERFERENCE	11.61 (7.42)	5.67 (5.51)		-8.52**	0.91
SAS-A	56.27 (13.12)	40.53 (13.42)		-11.43**	1.19
SAS-A FNE	26.38 (7.23)	18.88 (7.12)		-10.04**	1.04
SAS-A SADG	10.87 (3.30)	7.58 (2.76)		-10.22**	1.08
SAS-A SADN	18.99 (4.73)	13.94 (4.48)		-10.49**	1.10
SPAI-SP	93.45 (31.49)	53.24 (31.71)		-12.01**	1.27
SPAI-AG	23.80 (15.24)	12.17 (10.55)		-8.09**	0.89
SPS	34.55 (16.12)	17.98 (14.47)		-10.22**	1.08
SIAS	39.58 (12.36)	23.53 (13.05)		-12.15**	1.26
RSES	28.07 (5.46)	32.21 (4.77)		7.64**	-0.81
EI	14.94 (6.65)	9.60 (4.50)		-8.69**	0.94
QIDA	68.44 (24.45)	43.81 (23.60)		-9.76**	1.02
RAS	-6.98 (21.00)	17.83 (24.80)		10.47**	-1.08

Note. SPAI: Social Phobia and Anxiety Inventory; SPAI-SP: Social phobia subscale; SPAI-AG: agoraphobia subscale; SASA: Social Anxiety Scale for Adolescents; SASA/SAD-N: Avoidance and Distress in new situations subscale; SASA/FNE: fear of negative evaluation subscale; SASA/SAD-G: Avoidance and Distress in general situations subscale; SIAS: Social Interaction Anxiety Scale; SPS: Social Phobia Scale; EI: Inadaptation Scale; RSES: Rosenberg Self Esteem Scale; RAS: Rathus Assertiveness Scale; QIDA: Questionnaire about Interpersonal Difficulties for Adolescents.

\*\*  $p < .01$

a sensitivity of 69.6% and a specificity of 71.2%. Accordingly, the  $LR^+$  for this cut-off score was 2.41. This means that a self-reported case of SAD is 2.41 times more likely to be a true case than a non-case. The EDAS-Distress cut-off score of 10 displayed a sensitivity of 74.01% and a specificity of 74.36%, being the  $LR^+$  of 2.89. In the case of EDAS-Interference, the cut-off score of 7 yielded the best balance between sensitivity (69.16%) and specificity (66.03%), whereas  $LR^+$  was 2.04.

#### Predictive validity

Diagnoses on the ADIS-IV-L were the outcome variables (SAD or non-SAD). 7 models were contrasted. The variables entered as predictors in each of the first three models were EDAS-Avoidance, EDAS-Distress and EDAS-Interference, respectively. In the fourth model, the three EDAS subscales were introduced simultaneously as predictors. In models 5, 6 and 7 each of the EDAS subscales were entered simultaneously with SPAI-SP and SAS-A as predictors. The results of these analyses are depicted in Table 4.

The model with just the EDAS-Avoidance accounted for 31% of the variance in social phobia diagnoses, and resulted in 71.3% classification accuracy. The model with just the EDAS-Distress accounted for 35% of the variance and resulted in 75.7% classification accuracy. The model

with EDAS-Interference accounted for 22% of variance, with a classification accuracy of 68.9%. When including the three EDAS scales to the model simultaneously, the variance accounted for an increase to 37%, showing a 75.2% of classification accuracy. Only one variable significantly contributed to the model. The EDAS-Distress was related to diagnostic status,  $Wald(1) = 13.43$ ,  $p < .01$ , such that higher EDAS-Distress scores are better predictors of social phobia diagnoses, controlling for the other two predictors at their means. Model 5, entering EDAS-Avoidance, SPAI-SP and SAS-A resulted in 75.4% classification accuracy and accounted for 41% of the variance. Only the SPAI-SP significantly contributed to the model. In Model 6, variance accounted for (42%), which was similar to that of model 5 and classification accuracy was 76.5%. Both EDAS-Distress and SPAI-SP significantly contributed to the model. Finally, model 7 accounted for 41% of variance, and resulted in 75.9% classification accuracy. Both the SPAI-SP and the SAS-A were statistically significant.

#### Discussion

The aim of the present study was to analyse the accuracy and utility of EDAS subscales as a screening tool

Table 3  
Sensitivity and specificity of EDAS subscales

EDAS subscales	Sensitivity	Specificity	Positive likelihood ratio	Negative likelihood ratio
<b>AVOIDANCE</b>				
6	86.34	50.64	1.75	.27
7	81.06	59.62	2.01	.32
8	76.21	64.10	2.12	.37
9	69.60	71.15	2.41	.43
10	63.44	76.92	2.75	.48
11	57.71	82.69	3.33	.51
12	51.10	87.82	4.20	.56
13	46.26	91.03	5.15	.59
14	39.21	92.31	5.10	.66
15	34.80	94.87	6.79	.69
16	29.52	96.79	9.21	.73
<b>DISTRESS</b>				
6	88.99	48.08	1.71	.23
7	87.22	57.69	2.06	.22
8	84.14	63.46	2.30	.25
9	80.62	69.23	2.62	.28
10	74.01	74.36	2.89	.35
11	67.40	78.21	3.09	.42
12	58.15	82.69	3.36	.51
13	53.30	86.54	3.96	.54
14	45.37	89.74	4.42	.61
15	40.53	91.03	4.52	.65
16	35.68	93.59	5.57	.69
<b>INTERFERENCE</b>				
4	81.50	50.00	1.63	.37
5	78.41	55.13	1.75	.39
6	71.37	58.97	1.74	.49
7	69.16	66.03	2.04	.47
8	63.44	71.15	2.20	.51
9	56.83	75.64	2.33	.57
10	52.86	80.13	2.66	.59
11	48.02	89.74	4.68	.58
12	40.53	91.67	4.86	.65
13	35.68	92.31	4.64	.70
14	32.16	93.59	5.02	.72

for assessing social anxiety symptomatology in a non-referred sample of Spanish adolescents, of whom some have diagnoses of SAD. Overall, our estimations of reliability and validity evidence confirmed the screening usefulness and classification accuracy of the EDAS subscales.

Firstly, concerning estimations of reliability, satisfactory internal consistency was found. In the present study, moderate to high Cronbach's alpha coefficients for Avoidance, Distress and Interference subscales of EDAS were reported. These results indicate alpha coefficients above the recommended value of .70 by Nunnally (1978)

or .60 for reliable self-report instruments (Holmbeck et al., 2008). In addition, they are consistent with prior studies, showing values between .80 and .89 for EDAS scales (Olivares et al., 2004; Piqueras, Olivares, Hidalgo et al., 2011; Piqueras, Olivares, Vera-Villaruel et al., 2012; Vera-Villaruel et al., 2007). They are also comparable to those reported for other well-established self-reports that assess adolescent SAD (for example: SPAI, SPAI-B, SPAI-C, LSAS-CA, SPIN, SAS-A, etc.). Their values vary from .78 to .97 in Spanish-speaking (García-López et al., 2008; García-López et al., 2001; Olivares et al., 2002; Olivares et al., 1999; Olivares et al., 2009; Olivares, Vera-Villaruel,

Table 4  
Summary of binary logistic regression predicting social phobia diagnoses

Predictors	B	SE	Wald statistic	Nagelkerke R <sup>2</sup>	$\chi^2$
SAD Model 1					
EDAS-Avoidance	.20	.02	68.153**	.31	98.480**
SAD Model 2					
EDAS-Distress	.22	.02	76.43**	.35	116.78**
SAD Model 3					
EDAS Interference	.14	.02	52.29**	.22	69.67**
SAD Model 4					
EDAS-Avoidance	.07	.04	3.65 n.s.	.37	123.10**
EDAS-Distress	.14	.04	13.43**		
EDAS Interference	.03	.02	1.99 n.s.		
SAD Model 5					
EDAS Avoidance	.05	.04	2.09 n.s.	.41	35.872**
SPAI-SP	.03	.01	16.38**		
SASA-Total	.03	.01	3.48 n.s.		
SAD Model 6					
EDAS-Distress	.08	.04	5.10*	.42	25.220**
SPAI-SP	.02	.01	13.11**		
SAS-A-Total	.02	.01	2.05 n.s.		
SAD Model 7					
EDAS-Interference	.04	.02	2.51 n.s.	.41	67.247**
SPAI-SP	.03	.01	21.09**		
SAS-A-Total	.03	.01	4.32*		

Note. SPAI-SP: Social Phobia and Anxiety Inventory; Social Phobia subscale; SASA-Total: Social Anxiety Scale for Adolescents, total score:

\*  $p < .05$  \*\*  $p < .01$  ns not significant

et al., 2009; Olivares et al., 2010; Zubeidat, Salinas, & Sierra, 2008), North European (Gren-Landell et al., 2009; Ranta, Kaltiala-Heino, Rantanen, Tuomisto, & Marttunen, 2007) and North American (Anderson et al., 2009; Bailey et al., 2006; Inderbitzen-Nolan, Davies, & McKeon, 2004; Storch et al., 2004) samples.

Secondly, as expected, the EDAS subscales significantly correlated with well-established measures of SAD, such as the SIAS, SPS, SAS-A and SPAI-SP (.53-.82). These data are consistent with the study by Anderson et al. (2009). They found positive correlations of the MASC Social Anxiety Scale with measures such as the SAS-A and the SPAI-C, considering it as an evidence in favour of convergent validity, due to it would imply it measures the same construct as the other well-established SAD measures. Our study coincides with the results reported by a prior study with EDAS in a community population (Piqueras, Olivares, Hidalgo et al., 2011), where the subtests scores significantly correlated with the SPAI-SP and the SAS-A total score (correlations ranging from .50 to .76).

Furthermore, these results are consistent with many other validation studies of well-established measures of SAD, showing correlations between .38 and .92 (Anderson et al., 2009; García-López et al., 2001; Olivares, Sánchez-García, et al., 2009; Storch et al., 2004; Whiteside & Brown, 2008; Zubeidat et al., 2007). On the other hand, the divergent validity of the EDAS subscales would be supported by the lower correlations with other measures related to SAD. Our data indicated low but positive correlations between the EDAS subscales and the Agoraphobia subscale of the SPAI (range: .67-.68), and between the EDAS subscales and clinically-relevant related constructs measures, such as interpersonal difficulties, inadaptation, unassertiveness and low self-esteem (range: .43-.66). These data are similar to the correlations found by different studies, fluctuating between .04 and .57 (Anderson et al., 2009; Olivares, Sánchez-García, et al., 2009; Whiteside & Brown, 2008; Zubeidat et al., 2008; Zubeidat et al., 2007). These data support the validity of the EDAS and provide empirical evidence to the usefulness

of this scale as a screening tool for identifying adolescents with SAD and as an assessment tool for adolescents in school settings.

Thirdly, results also supported the hypothesis that adolescents in the SAD group would have higher mean scores than adolescents in the non-SAD group on the EDAS subscales, showing large effect size in all comparisons. The same significant group effect was found for the remaining instrument scores in favour of the SAD group. This is consistent with previous studies, which found the highest mean scores on different social anxiety measures for adolescents with SAD, followed by those with subclinical SAD and finally those without SAD (Anderson et al., 2009; García-López et al., 2001; Ranta et al., 2007; Whiteside & Brown, 2008). These data show evidence in favour of discriminant validity of the EDAS scales to differentiate between adolescents with SAD and non-SAD adolescents, supporting the suitability of EDAS as a screening tool.

The present study examined the sensitivity and specificity of the EDAS subscales using ROC analysis. Overall, results indicated areas under the curves between .74 and .81. Values between .70 and .80 are considered as adequate, whereas those higher than .80 are good (Bailey et al., 2006). According to the data in this study, Avoidance, Distress and Interference scores above 9, 10 and 7, respectively, are recommended because they provide the optimal balance between the percentage of true positive and true negative in real cases. These cut-off scores led to an acceptably low percentage of adolescents incorrectly identified with SAD (specificity = 66.03-74.36%) and an adequate proportion of adolescents being overlooked in terms of heightened social phobia symptomatology (Sensitivity = 69.16-74.01%). Specificity values of at least 70% are considered essential, whereas the greater the value of specificity, the more cost-efficient the instrument is, with values above 80% considered as useful (Bailey et al., 2006). However, as noted, the main purpose of the EDAS is not diagnostic classification, but rather to serve as a screening measure of SAD, such that scores above an empirically established cut-off should indicate that further evaluation is needed. Therefore, depending on the intended purpose of the EDAS, the potential user of this scale could choose a lower cut-off score, which might be more appropriate. For example, a cut-off score of 7 on the EDAS-Avoidance score, of 9 or even 8 on the EDAS-Distress or 5 or 6 on EDAS-Interference could be advantageous for screening adolescents in clinical settings in order to avoid overlooking adolescents who need further assessment. On the other hand, a more conservative cut-off score of 10-11, 11-12 or 9-10, respectively, might be justified when using these subscales for research purposes in order to avoid false positives (see Table 3). Our sensitivity/specificity results are similar to findings of other SAD screening instruments (SPAI-C, SAS-A, SPIN, SPSQ, MASC-Social, SCARED-

Social Phobia and Social Worries Questionnaire-SWQ), displaying sensitivity values from 43.6% to 91%, specificity from 60% to 86%, AUCs from .77 to .89 and LR+ from 2.19 to 5.07 (Aune, Stiles, & Svarva, 2008; Connor et al., 2000; Piqueras, Olivares, Hidalgo et al., 2011; Ranta et al., 2007; Whiteside & Brown, 2008).

With regard to the comparison of the AUCs for the three EDAS subscales, the results indicated that there were only differences between the areas of EDAS-Distress and EDAS-Interference. Furthermore, the Distress subscale proved to be more sensitive (74.36%, 69.60% and 69.16%, respectively) and more specific (74.36%, 71.2% and 66.03%, respectively) than the Avoidance and Interference subscales. Consequently, the Distress scale seems to be the most balanced, followed by Avoidance and then Interference. In any case, these values are coherent with those reported by other studies (Anderson et al., 2009; Bailey et al., 2006; Beidel et al., 1995; Gren-Landell et al., 2009; Inderbitzen-Nolan et al., 2004; Ranta et al., 2007).

Regarding predictive validity of the EDAS subscales, results of binary logistic regression analyses indicated that the scales were significant predictors of SAD diagnosis (classification accuracy of 71.3%, 75.7% and 68.9%, respectively). The inclusion of the three scales classified accurately at 75.2%, although only the Distress scale proved to be a significant predictor, after controlling the other two scales. Furthermore, the increase in the Nagelkerke  $R^2$  or the variance accounted for was small. When the SPAI-SP and the SAS-A were added to the model of each EDAS subscale, the variance accounted for increased, although the EDAS-Distress score maintained the only significant predictor. Furthermore, the SPAI-SP proved to be a significant predictor in the three combined models and the SAS-A in the model with just the Interference subscale. These results are consistent with the findings of a prior study (Anderson et al., 2009) which resulted in a classification accuracy of MASC Social Anxiety scale of 79% and of 82%, when adding the SPAI-C and the SAS-A to the predictive model. The addition of these two well-established measures to the model with just the MASC Social Anxiety scale increased the variance accounted for from 28% to 36%, being equivalent to our results. All these data seem to indicate that, if the purpose is to use the EDAS as a screening tool, the use of just one subscale would be widely justified, in particular the EDAS-Distress. It presents the best values in all the estimations of evidence of validity and reliability.

Overall, the results of this study reached the objective of providing evidence about the clinical usefulness and diagnostic accuracy of the EDAS subscales as a screening tool for SAD symptomatology in the Spanish adolescent population with or without SAD. However, more studies are needed to confirm these findings and to broaden the validation of the test in outpatient clinical population and in other different populations, such as Spanish-speakers

adolescents from USA. This study, therefore, presents some limitations regarding method: our sample is not representative of the general Spanish population, which is an obstacle for the generalization of these results (younger samples, adolescent clinical samples and more heterogeneous educational and professional backgrounds should be considered). In spite of these limitations and considerations, this study provides valuable insight into the quality and utility of the EDAS in the assessment of social anxiety in adolescence. To sum up, this study was able to contribute to empirical evidence on the reliability and validity of this scale, its diagnostic accuracy, discriminatory capacity and clinical utility in Spanish adolescent population with SAD.

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## APPENDIX

## Escala para la Detección de la Ansiedad Social (EDAS; Olivares y García-López, 1998)

NOMBRE: \_\_\_\_\_ EDAD: \_\_\_\_\_  
 INSTITUTO: \_\_\_\_\_ CURSO: \_\_\_\_\_ SEXO: \_\_\_\_\_

Esto no es un examen, no hay respuestas correctas o incorrectas. Por favor, contesta cada frase tan sinceramente como puedas. Marca tu elección (SI o NO) con una X

Hay personas que se ponen nerviosas cuando están con gente que no conocen bien. Esto les ocurre si están con una o más personas extrañas o poco conocidas. No importa el lugar. Se pueden sentir mal en una fiesta, en un bar o simplemente mientras se habla en grupo aunque ello no le obligue a uno a participar.

1. **¿Te ocurre algo de esto a ti?** SI \_\_\_ NO \_\_\_
2. **¿Generalmente te preocupa cuando tienes que decir o hacer algo porque piensas que ello te puede poner en evidencia ante los demás?** SI \_\_\_ NO \_\_\_
3. Teniendo en cuenta el cuadro de SITUACIONES que te presentamos más abajo, nos gustaría que valoraras el grado de nerviosismo que sientes en esas situaciones, la frecuencia con que te pasa y en qué medida ha interferido tu miedo o la evitación de estas situaciones en tu vida cotidiana. Para ello, usa las escalas que te presentamos a continuación:

<i>¿Con qué frecuencia intentas evitar (no hacer) esta situación?</i>	<i>¿Qué grado de nerviosismo te produce esta situación?</i>	<i>¿Cuánto ha interferido en tu vida cotidiana?</i>
1 = Nunca	1 = Ninguno	1 = Nada
2 = Pocas Veces	2 = Un Poco	2 = Un Poco
3 = Algunas Veces	3 = Bastante	3 = Bastante
4 = Bastantes Veces	4 = Mucho	4 = Mucho
5 = Siempre	5 = Muchísimo	5 = Muchísimo

Por favor, rodea con un círculo el número que mejor te describe en cada situación.

SITUACIONES	<i>¿Con qué frecuencia intentas evitar, no hacer, lo que se describe en esta situación?</i>	<i>¿Qué grado de "nerviosismo" te produce esta situación?</i>	<i>¿Cuánto ha interferido esta situación en tu vida cotidiana?</i>
Iniciar una conversación	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Mantener una conversación	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Ir a fiestas o reuniones sociales	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Hablar en público	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Escribir, comer o beber delante de gente	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Defender mis derechos ante otras personas	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Relacionarme con figuras de autoridad (padre, profesores, personas mayores, etc.)	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Relacionarme con personas del sexo opuesto	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

**Social Anxiety Screening Scale (SASS/EDAS; Olivares and García-López, 1998)**

NAME: \_\_\_\_\_ AGE: \_\_\_\_\_

SCHOOL: \_\_\_\_\_ GRADE: \_\_\_\_\_ SEX: \_\_\_\_\_

This is not a test. There are no right or wrong answers. Please answer each sentence as honestly as you can. Put a cross X next to your choice (YES or NO).

Some people get nervous when they're with strangers or with people they do not know well. It may happen anywhere; at a party, in a cafe, at social events or just when they're with a group of people, although they do not have to participate.

**1. Does any of this happen to you?** YES \_\_\_ NO \_\_\_

**2. Are you usually afraid of speaking or acting in a way that will be humiliating or embarrassing to you?** YES \_\_\_ NO \_\_\_

**3. Based on the situations mentioned below, we would like you to score how nervous you feel in a specific situation, how often you avoid that situation and to what extent it interferes with your daily life. Please, use these scales:**

<i>How often do you avoid this situation?</i>	<i>How nervous do you feel in this situation?</i>	<i>To what extent does this situation interfere with your life?</i>
1= Never 2= Rarely 3= Sometimes 4= Often 5= Usually	1= Not at all 2= A little 3= Moderately 4= A lot 5= Extremely	1= Not at all 2= A little 3= Moderately 4= A lot 5= Extremely

Please circle the number that best describes how you feel in each situation.

<i>SITUATIONS</i>	<i>How often do you avoid this situation?</i>	<i>How nervous do you feel in this situation?</i>	<i>To what extent does this situation interfere with your life?</i>
Starting conversations	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Maintaining conversations	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Going to parties or social meetings	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Speaking in public	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Writing, eating or drinking in front of others	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Being assertive	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Meeting figures of authority (parents, teachers, adults)	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Meeting members of the opposite sex	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

\* English version of EDAS using a translation-backtranslation method and the International Tests Commission guides.