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THE ASSESSMENT OF SOCIAL ANXIETY THROUGH FIVE SELF-REPORT MEASURES, LSAS-SR, SPAI, SPIN, SPS, AND SIAS: A CRITICAL ANALYSIS OF THEIR FACTOR STRUCTURE

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Abstract

The assessment of social anxiety through self-report measures often involves questionnaires that are widely used at the international level: SPAI, LSAS-SR, SPIN, SPS, and/or SIAS. In this study, these questionnaires were administered to university students, and their factor structure, reliability and internal consistency were obtained. The best factor solutions for these self-report measures were as follows: SPAI, six factors; LSAS-SR Anxiety subscale, five factors; SPIN, three factors; SPS, three factors, and SIAS, three factors. The reliability and internal consistency of these questionnaires was adequate. A critical analysis was made of the different solutions obtained for the various questionnaires in light of the dimensional structure of social anxiety established for a new self-report measure, the "Social Anxiety Questionnaire for Adults" (SAQ-A30). Finally, these findings were discussed in terms of their relevance for a more efficient assessment of social anxiety both in terms of the general population and at the clinical level.

KEY WORDS: *social anxiety, social phobia, SAQ-A30, self-report, assessment, factor structure, reliability, internal consistency.*

Resumen

La evaluación de la ansiedad social por medio de medidas de autoinforme suele utilizar alguno de los cuestionarios ampliamente conocidos a nivel internacional: el SPAI, la LSAS-SR, el SPIN, la SPS y/o la SIAS. En el presente estudio dichos cuestionarios se han aplicado a estudiantes universitarios, prestando especial atención a su estructura factorial y, en menor medida, a su fiabilidad y a su consistencia interna. Las mejores soluciones factoriales para estas medidas han sido las siguientes: para el SPAI, seis factores, para la subescala de ansiedad de la LSAS-SR, cinco factores, para el SPIN, tres factores, para la SPS, tres factores y para la SIAS, tres factores. La fiabilidad y la consistencia interna de estos cuestionarios son adecuadas. Se han comparado las diferentes soluciones obtenidas por los distintos cuestionarios y se ha realizado un análisis crítico de su estructura factorial a la luz de la estructura dimensional de la ansiedad social establecida por una nueva medida de autoinforme, el "Cuestionario de ansiedad social para adultos" (CASO-A30). Finalmente, se ha planteado la relevancia de

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estos análisis para una evaluación más eficiente de la ansiedad social tanto a nivel de la población general como a nivel clínico.
PALABRAS CLAVE: *ansiedad social, fobia social, CASO-A30, autoinforme, evaluación, estructura factorial, fiabilidad, consistencia interna*.

Introduction

Social anxiety disorder (SAD) (or social phobia, SP) is one of the most common anxiety disorders, being characterized by intense fear or anxiety when facing one or more social situations in which an individual is exposed to possible judgment/observation by other people (*American Psychiatric Association* [APA], 2013). Self-report is the assessment method used most often and extensively worldwide for evaluating SAD, and they include the following: the *Social Phobia and Anxiety Inventory* (SPAI; Turner, Beidel, Dancu, & Stanley, 1989), the *Liebowitz Social Anxiety Scale Self-Report* (LSAS-SR; Liebowitz, 1987), the *Social Phobia Inventory* (SPIN; Connor *et al*., 2000), the *Social Phobia Scale* (SPS; Mattick & Clarke, 1988, 1998) and the *Social Interaction Anxiety Scale* (SIAS; Mattick & Clarke, 1988, 1998).

The SPAI was based on other questionnaires, on the review of the diagnostic criteria specified in DSM-III, and on a list of complaints made by a number of patients. Turner, Beidel *et al.* (1989) considered the importance of having an instrument that would measure different aspects of SP, including cognitive, somatic and behavioral signs or symptoms that might be manifested by individuals with SP across an array of possible fearful situations thereby providing a measure of the severity of the disorder. The SPAI consists of 45 items arranged into two subscales, one for Social phobia (32 items) and the other for Agoraphobia (13 items). Out of the total items forming the first subscale, 21 have a four choice format for assessing the degree of discomfort with different kinds of people (strangers, figures in authority, opposite sex, people in general), two refer to physiological responses, another two to cognitive responses, and a further seven require a simple answer, with the result being 96 items overall. These items are answered on a 7-point Likert scale (from 1= "never" to 7= "always"). In order to obtain the individual score in the multiple-choice items, the mean is calculated using the answers given in each of the several sub-items. The score for the Agoraphobia subscale is obtained by directly adding up the points for its component items. The overall score for the SPAI is obtained by subtracting the Agoraphobia subscale from its social phobia counterpart.

It appears that measures from this instrument are sensitive to a continuum of concerns among socially anxious individuals and also distinguish between this group of people and other individuals with different anxiety disorders. As regards their psychometric properties, the literature has reported suitable levels of test-retest reliability and internal consistency (e.g., Osman, Barrios, Aukes, & Osman, 1995; Turner, Beidel *et al*., 1989). It was initially considered that 60 would be the most appropriate cut-off point for identifying those individuals with social phobia, but a different cut-off point (88) was subsequently proposed by Peters (2000).

Regarding its factorial structure, the initial solution included two factors corresponding to the inventory's two subscales (Turner, Stanley, Beidel, & Bond, 1989), with this structure being later supported by Osman *et al*. (1996). Nevertheless, Turner, Stanley *et al*. (1989) analyzed the possible dimensions of SP by using solely the SP subscale, and they found two different factorial solutions using two different samples. One solution (with a general sample) involved five factors explaining 64% of the cumulative variance: 1) Individual social interaction (11 items), 2) Somatic and cognitive issues (8 items), 3) Group interaction (7 items), 4) Avoidance (5 items), and 5) Being the center of attention (5 items), and the other solution (with a clinical sample) involved three factors explaining 66.4% of the cumulative variance: 1) SP (31 items), 2) Somatic (3 items) and 3) Avoidance (2 items). Four of the five items composing factors 2 and 3 also had high loadings in factor 1. The 5-factor structure of the SP subscale of the SPAI was subsequently supported by Osman *et al*. (1995). In Spain, Baños, Botella, Quero, and Medina (2007) reported the 2-factor structure of the SPAI corresponding to the two subscales that theoretically compose the inventory, explaining 58.1% of the cumulative variance. The sensitivity of the SPAI for assessing the outcome of cognitive-behavioral therapies for SP has also been supported (e.g., Cox, Ross, Swinson, & Direnfeld, 1998; Ries *et al*., 1998; Taylor, Woody, McLean, & Koch, 1997).

The LSAS was the first scale created for the clinical rating of patients' level of fear and avoidance of social situations (*Clinician-Administered Version*, LSAS-CA), although it was subsequently adapted and introduced as a self-report measure (S*elf-Report Version*, LSAS-SR) (e.g., Baker, Heinrichs, Kim, & Hofmann, 2002; Cox *et al*., 1998), given that the psychometric properties of both versions were similar (Fresco *et al*., 2001; Oakman, van Ameringen, Mancini, & Farvolden, 2003). This scale consists of 24 items that assess the degree of fear in, and the frequency of avoidance of, social interaction situations (13 items) and performance (11 items). Its response format is a 4-point Likert scale that provides an overall score for the scale itself and for both subscales. Some studies use the subscales that are theoretically derived from this measure: scale total, fear total, avoidance total, fear of social interaction, avoidance of social interaction, fear of performance, avoidance of performance, total social interaction and total performance. The LSAS-SR has also been frequently used for assessing changes in patients when they have received both pharmacological treatment (e.g., Liebowitz, 1987; Bhogal & Baldwin, 2007; Guastella *et al*., 2008) and cognitive-behavioral therapy for social anxiety (e.g., Cox *et al*., 1998; Hayes, Miller, Hope, Heimberg, & Juster, 2008; Heimberg *et al*., 1999; Hofmann, Schulz, Meuret, Moscovitch, & Suvak, 2006; Klinger *et al*., 2005; Smits, Powers, Buxkamper, & Telch, 2006).

In the past ten years the LSAS-SR has been used for SP using cut-off points of 30 and 60, with a goal of establishing whether the individual has a circumscribed SAD or meets the specification of the "generalized" subtype (Mennin *et al*., 2002; Rytwinski *et al*., 2009). Nevertheless, different proposals have been presented in Brazil as regards the cut-off points. Kummer, Cardoso, and Teixeira (2008) posited that 42 would be the most suitable cut-off point, striking a better balance between sensitivity and specificity, while Terra *et al*. (2006) used other cut-off

points for assessing the severity of SP in hospitalized alcoholic patients; thus, scores below 52 suggested a slight level, between 52 and 81 was a moderate level, and scores above 82 indicated a severe level of SP.

Regarding the psychometric properties of the LSAS-SR, the literature has reported good indices of test-retest reliability and adequate internal consistency, and convergent and discriminant validity (e.g., Baker *et al*., 2002; Fresco *et al*., 2001; Heimberg *et al*., 1999), even with versions translated into other languages (e.g., Heeren *et al*., 2012; Levin, Marom, Gur, Wechter, & Hermesh, 2002; Sugawara *et al*., 2012; Terra *et al*., 2006). A very wide range of structural solutions have been proposed for this scale. A 3-factor solution, explaining 56% of the total variance, includes the following: 1) Public performance, 2) Social interaction, and 3) Observation (Romm *et al*., 2011). There is another 4-factor solution, proposed by Safren *et al*. (1999), explaining 53.6% of the cumulative variance, and which was subsequently replicated by Oakman *et al*. (2003) and Beard *et al*. (2011) including the following: 1) Social interaction, 2) Public speaking, 3) Observation by others, and 4) Eating and drinking in public. Despite identifying four factors, Sugawara *et al*. (2012) found that the model proposed by Safren *et al*. (1999) did not explain their data any better, while this was indeed the case with the original model formed by the following factors: 1) Fear of performance, 2) Fear of interaction, 3) Avoidance of performance, and 4) Avoidance of interaction. The 5-factor structural solutions are even more different from one another. For example, Baker *et al*. (2002) found that the following five factors explained 60.3% of the total variance: 1) Social interaction, 2) Non-verbal performance, 3) Ingestion, 4) Public performance, and 5) Assertiveness. Perugi *et al*. (2001) reported that their factors explained 64.7% of the total variance, being as follows: 1) Interpersonal, 2) Formal speaking, 3) Stranger-authority, 4) Eating and drinking while being observed, and 5) Doing something while being observed; and Terra *et al*. (2006), upon conducting a different analysis (including all the items from the two subscales), found that the following five factors explained 52.9% of the total variance: 1) Speaking in a group, 2) Activity in public, 3) Social interaction with a stranger, 4) Attitude of disagreement or disapproval, and 5) Leisure activity. Another factorial solution was the one reported by Heeren *et al*. (2012), and which corresponds to eight first-order factors (four from the Anxiety subscale and four from the Avoidance subscale, as proposed by Safren *et al*.) and two second-order latent factors (Fear and Avoidance). According to Bobes *et al*. (1999) and González *et al*. (1998), the Spanish version of the LSAS-SR consisted of four factors that explained 48.9% of the variance and recorded high levels of internal consistency ($\alpha \geq .86$).

The SPIN was developed on the basis of the clinician-administered *Brief Social Phobia Scale* (BSPS; Davidson *et al*., 1991; Davidson, Miner, De Veaugh-Geiss, & Tupler, 1997). The SPIN consists of 17 items that assess the presence and severity of several aspects of social anxiety over the preceding week: 1) fear of, for example, people in authority, parties and social gatherings/events, of being criticized, of speaking to strangers, of doing things when people are watching and of being embarrassed, 2) the avoidance of, for example, speaking to strangers, or talking to people out of fear of being embarrassed, going to parties, being the

center of attention, giving a speech, being criticized, speaking to people in authority, and 3) physiological symptoms, such as blushing, sweating, having palpitations or shaking and trembling in front of other people. The items are answered on a 5-point Likert scale (from 0= "not at all" to 4= "a great deal"), with the overall score being between 0 and 68, and the cut-off point for identifying people with SP being 19 (Connor *et al*., 2000).

In terms of psychometric evaluation, the literature has reported good test-retest reliability ($r \geq .86$, $p < .001$) and adequate internal consistency for the total scale ($\alpha \geq .87$) (Antony, Coons, McCabe, Ashbaugh, & Swinson, 2006; Connor *et al*., 2000). Concerning SPIN factor solutions, three factors have been proposed by Osório, Crippa, and Loureiro (2010) and Radomsky *et al*. (2006) and five factors by Connor *et al*., (2000) and Osório *et al*. (2010), although there is variability in their component items or the aspect/dimension of social anxiety they assess. Regarding the 3-factor solution, Osório *et al*. (2010) found the following: 1) Fear and avoidance of situations of social evaluation and of figures of authority and physiological symptoms (11 items), 2) Fear and avoidance of interaction with strangers, of public speaking, and of being the center of attention (4 items), and 3) Fear and avoidance of social events (3 items), while Radomsky *et al*., 2006) found: 1) Fear of social situations, 2) Avoidance of social situations, and 3) Physiological symptoms of anxiety. In turn, regarding the 5-factor solutions, Connor *et al*. (2000) found five factors assessing fear and avoidance of the following: 1) Talking to strangers and in social gatherings, 2) Criticism and embarrassment, 3) People in authority, 4) Physiological changes, and 5) Being the center of attention and public speaking. Osório *et al*. (2010) described their factors as: 1) Fear and avoidance of situations of social evaluation and physiological symptoms (9 items), 2) Fear and avoidance of figures of authority (2 items), 3) Fear and avoidance of social events (2 items), 4) Fear and avoidance of interaction with strangers (2 items), and 5) Avoidance of public speaking and of being the center of attention (2 items).

Research has also examined the sensitivity of the SPIN to changes following pharmacological treatment (Connor *et al*., 2000) and group cognitive-behavioral therapy (Antony *et al*., 2006). The versions of the SPIN used in France (e.g., Radomsky *et al*., 2006), Germany (e.g., Sosic, Gieler, & Stangier, 2008), and Brazil (e.g., Osório, Crippa, & Loureiro, 2009; Osório *et al*., 2010) have high levels of internal consistency ($\alpha \geq .90$). No reports have been forthcoming in Spain on its psychometric properties with the adult population, although García-López, Bermejo, and Hidalgo (2010) found that the one-factor solution was the more appropriate with adolescents, and that the inventory had a high level of internal consistency ($\alpha = .92$).

The SPS and the SIAS are often used in a complementary manner to assess social anxiety. The former measures the level of anxiety associated with scrutiny or observation by other people while performing a task or action (e.g., working, eating, drinking, writing, using public bathrooms), and the latter measures the level of anxiety related to the initiation and maintenance of social interactions (e.g., meeting and talking with strangers, friends, or people of the opposite sex). Following Mattick and Clarke (1998), these scales correspond to the descriptions of DSM-III-R on circumscribed and generalized SP, respectively, and they appear to

be of use in the identification of individuals with SP (Mattick & Clarke, 1998; Peters, Sunderland, Andrews, Rapee, & Mattick, 2012). The items in these scales include items modified from other questionnaires, inventories or scales related to social anxiety, such as the *Fear Survey Schedule* (FSS; Wolpe & Lang, 1964), the *Fear of Negative Evaluation* scale (FNE; Watson & Friend, 1969) or the *Social Anxiety Inventory* (SAI; Richardson & Tasto, 1976) as well as new items based on clinical interviews with patients with social phobia and anxiety. The SIAS initially had 19 items and the SPS had 20 (Mattick & Clarke, 1988), but another item was later added to SIAS, so it also had currently 20 items (Mattick & Clarke, 1998). The response options also involve a Likert scale that ranges from 0 ("not at all typical of me") to 4 ("very typical of me").

Several studies have shown that the psychometric properties of SPS and SIAS are acceptable. The levels of internal consistency range between .88 and .94, and test-retest reliability is between .90 and .92 (e.g., Erwin, Heimberg, Marx, & Franklin, 2006; Harb, Heimberg, Fresco, Schneier, & Liebowitz, 2002; Mattick & Clarke, 1998; Osman, Gutierrez, Barrios, Kopper, & Chiros, 1998; Tanner, Stopa, & De Houwer, 2006). Regarding factor structure, Mattick & Clarke (1998) reported that the SPS was composed of three factors explaining 47.70% of the variance: a first factor that represented a general concern for scrutiny, being observed or attracting attention in an array of public places; a second factor involved items related to specific fears, such as writing in public, drinking in public or trembling, and a third factor is related to the fear of appearing to be ill, strange or losing control in front of other people. These data are consistent with clinical observation (e.g., APA, 1980, 1987) and empirical research (e.g., Turner *et al.,* 1986), suggesting there is heterogeneity in the fears of being scrutinized in specific SP. Regarding the SIAS, Mattick and Clarke (1998) found a single factor explaining 43.40% of the variance. Nevertheless, for other studies, in which a joint analysis has been conducted of the 40 items of the two scales, a 3-factor model has been proposed. Habke, Hewitt, Norton, and Asmundson (1997) noted that the first factor corresponded to SPS items and the other two to SIAS items and explained 52.50% of the cumulative variance, while Safren, Turk, and Heimberg (1998) found that one factor contained SIAS items (named *Interaction anxiety)* and the other two factors contained SPS items (*Anxiety about being observed by others*, and *Fear that others will notice anxiety symptoms*). The results reported by Habke *et al*. (1997) were subsequently replicated by Osman *et al*. (1998), who in turn proposed a unidimensional solution for each scale. Ten years later, Carleton *et al*. (2009) once again reported on three factors (explaining 59% of the cumulative variance), but this time with a much smaller number of items (14 in total) and a distribution that ran contrary to the one by Habke *et al*. (1997) and similar to that by Safren *et al*. (1998), as the SIAS items formed a factor (named as *Social interaction anxiety*) and the SPS items formed two factors (*Fear of overt evaluation*, and *Fear of attracting attention*). The strong, significant correlations between the items of the new factor of the SIAS and the original SIAS, as well as the new factors of the SPS and the original SPS, indicate that those new factors are representative of the original scales.

Rodebaugh and his team of collaborators have raised doubts about the unidimensionality of the SIAS and have questioned the inclusion of reverse-scored items (Rodebaugh, Woods, & Heimberg, 2007; Rodebaugh, Woods, Heimberg, Liebowitz, & Schneier, 2006). This scale has been shown to be sensitive to the changes associated with group cognitive-behavioral therapy (Antony, Coons, McCabe, Ashbaugh, & Swinson, 2006).

As with other self-report measures, the SPS and the SIAS have been translated into other languages, and two studies, one in Spain (Olivares, García-López, & Hidalgo, 2001) and the other in Germany (Heidenreich, Schermelleh-Engel, Schramm, Hofmann, & Stangier, 2011), have supported the 2-factor solution, and indicated that the SPS and the SIAS measure aspects that are part of the same construct, although they are different aspects of social anxiety. The difference between these studies lies in the fact that Olivares *et al*. (2001) analyzed the items in each scale separately, whereas Heidenreich *et al*. (2011) did so jointly. Nevertheless, there is no general consensus on these results. Following an analysis of the German version of SIAS, Eidecker, Glöckner-Rist, and Gerlach (2010) suggested discarding the three items opposed to the construct evaluated (positively phrased), leaving the scale with 17 items and four factors. Kupper and Denollet (2012) explored the factor structure of the Dutch versions of the SPS and the SIAS (separately) and proposed abridged versions of 11 and 10 items, respectively, with their corresponding factor solutions of three and two factors, and with high levels of internal consistency.

Regarding the predictive validity of the SPS and the SIAS, some evidence suggests that these combined scales are able to predict the anxiety response in the face of social challenges (Gore, Carter, & Parker, 2002). An abbreviated version of both these scales has recently been developed, the SPS-6 and the SIAS-6, each one with six items (Peters *et al*., 2012). According to the authors, these scales correlate very closely with the original scales ($r_{SIAS\text{-}SIAS\text{-}6=}$ .88, $r_{SPS\text{-}SPS\text{-}6=}$ .92) and are of use for the diagnosis of SP using seven or more as cut-off points in SIAS-6, and two or more in SPS-6. Peters *et al*. (2012) also reported that the new measures are sensitive to the treatment-related changes, indicated by the strong, significant correlations (pre/post-treatment and pre-treatment/follow-up) between the standardized scores for the change measured with the four self-reports.

One self-report measure that has recently been created for assessing social anxiety on a transcultural level in Iberoamerican countries is called the Social Anxiety Questionnaire for Adults (SAQ-A30; Caballo, Salazar, Arias *et al*., 2010; Caballo, Salazar *et al*., 2012; Caballo, Arias *et al*., 2013). This questionnaire consists of 30 items that are answered through the use of a 5-point Likert scale (from 1= "not at all/very little" through to 5= "a lot/very much") to indicate the level of discomfort, stress or nervousness in each social situation. The five dimensions (subscales) of social anxiety this questionnaire evaluates are as follows: 1) Speaking in public/Talking with people in authority, 2) Interactions with the opposite sex, 3) Assertive expression of annoyance, disgust or displeasure, 4) Criticism and embarrassment, and 5) Interactions with strangers. Each subscale consists of six items distributed randomly throughout the questionnaire, with a score being recorded for each dimension (subscale), and an overall score provided

by directly adding each individual's answers. The 5-factor structure has been shown to be sound and stable, with a cumulative variance ranging from 40.80% to 54.39%) in community and clinical samples. Levels of reported consistency (Cronbach's alpha) for the total score of the SAQ-A30 are high (from .88 to .93), and from moderate to high (from .66 to .90) for the subscales. The reported reliability (Guttman split-half reliability) of the overall score for SAQ-A30 is high (from .82 to .91) (Caballo, Arias *et al*., 2013; Caballo, Salazar *et al*., 2012; Caballo, Salazar, Arias *et al*., 2010; Salazar, 2013).

The aim of this study was to use university samples to analyze the factorial structure of the five self-report measures most widely used internationally (LSAS-SR, SPAI, SPIN, SPS, and SIAS), while taking into account the dimensions of social anxiety proposed by the SAQ-A30, which has recently been validated for most Latin American countries, as well as in Spain and Portugal. Psychometric data from the self-reports instruments, particularly reliability (internal consistency and item-total correlations), will also be reported.

Method

Participants

The first group of participants involved 1,036 university students from different majors, including Psychology, of whom 797 were women (*M*= 21.36 years, *SD*= 3.54) and 239 were men (*M*= 22.58 years, *SD*= 5.38). Nevertheless, not all the participants filled in all the questionnaires. The whole sample completed the SPAI, while fewer answered the LSAS-SR and the SPIN. Specifically, the LSAS-SR was completed by 512 individuals, of whom 377 were women (*M*= 21.57 years, *SD*= 4.68) and 135 men (*M*= 23.00 years, *SD*= 6.41), while the SPIN was completed by 372 women (*M*= 21.57 years, *SD*= 4.71) and 133 men (*M*= 23.03 years, *SD*= 6.45).

The second group of participants consisted of 183 university students from different majors, who completed the SPS and the SIAS, being divided into 141 women (*M*= 23.89 years, *SD*= 6.43) and 42 men (*M*= 23.83 years, *SD*= 5.53).

Instruments

- The *Social Phobia and Anxiety Inventory* (SPAI; Turner *et al.,* 1989) is designed to measure the frequency of the feeling of anxiety, its physiological symptoms and associated thoughts in different situations and contexts. It is a self-report measure consisting of 45 items, 32 of which are in the Social phobia (SP) section and 13 in Agoraphobia. Nevertheless, 21 of the items assessing SP are made up of sub-items, whereby the 32 items become 96 items and sub-items. Each item/sub-item in SPAI is answered on a 7-point Likert scale that ranges from 1= "never" to 7= "always". The score for the SP subscale is obtained by adding up the points for the first 32 items (the mean is used for those items made up of sub-items) and for the Agoraphobia sub-scale by adding up the remaining 13 items. The total score for the inventory is obtained by

subtracting the score for the Agoraphobia subscale from the score for the SP subscale. Regarding Spanish samples, the proposal has involved a two-factor solution (Baños *et al*., 2007; Turner, Stanley *et al*., 1989) and a 4-factor one (Olivares, García-López, Hidalgo, Turner, & Beidel, 1999) (using only the 32 items measuring SP).

- The *Liebowitz Social Anxiety Scale-Self-Report version* (LSAS-SR; Liebowitz, 1987) consists of 24 items that assess the degree of fear or anxiety (constituting the Anxiety subscale) and the frequency of avoidance (forming the Avoidance subscale) associated with a series of social situations. Each subscale is scored separately on a 4-point Likert scale (from 0= "none/never" to 3= "severe/usually"). The overall score for the scale, as well as for both subscales, is obtained by adding the direct ratings each individual provides. Following Bobes *et al*. (1999) and González *et al*. (1998), the Spanish version of the LSAS-SR consists of four factors explaining 48.90% of the variance. The literature has reported suitable levels of internal consistency, with Cronbach's alpha for the Anxiety subscale being between .83 and .92, between .84 and .91 for the Avoidance subscale, and between .86 and .95 for the overall score (González *et al*., 1998; Salazar, 2013). The Guttman split-half reliability of the total score of the LSAS-SR ranges from moderate to high (from .79 to .94) (Salazar, 2013).
- The *Social Phobia Inventory* (SPIN; Connor *et al.,* 2000) consists of 17 items that assess different aspects of social anxiety over the preceding week: Fear, Avoidance and Physiological symptoms. The items are scored on a 5-point Likert scale (from 0= "not at all" to 4= "a great deal"). To date, there are no data available on the psychometric properties of the SPIN as regards the Spanish adult population. A one-factor solution has been reported for a sample of adolescents, with a high internal consistency (α= .92) (García-López *et al.*, 2010).
- The *Social Phobia Scale* (SPS; Mattick & Clarke, 1998) measures the level of anxiety associated with being judged or observed by other people while performing a task or action. The SPS comprises 20 items with Likert-type responses on a scale ranging from 0 ("not at all typical of me") to 4 ("very typical of me"). Mattick and Clarke (1998) reported that the SPS was made up of three factors explaining 47.70% of the variance. In Spain, a one-factor solution has been reported with a high internal consistency (α= .90) (Olivares *et al*., 2001).
- The *Social Interaction Anxiety Scale* (SIAS; Mattick & Clarke, 1988, 1998) measures the level of anxiety associated with initiating and maintaining social interactions (e.g., meeting and speaking to strangers, friends or persons of the opposite sex). The SIAS consists of 19 items (although another item was added in a subsequent version) with Likert-type answer options on a scale from 0 ("not at all typical of me") to 4 ("very typical of me"). Mattick and Clarke (1998) reported that the SIAS involved one factor explaining 43.40% of the variance. In Spain, a one-factor solution has been reported with a high internal consistency (α= .89) (Olivares *et al*., 2001).

Procedure

The instruments were applied in several faculties at Granada University. In the case of the first sample, the three questionnaires were sometimes completed at the same time, while on others only the SPAI was used. As regards the second sample, the two instruments were always answered at the same time. Individuals completed the questionnaires anonymously in order to ensure the privacy of their answers.

Data analysis

The statistical program *Statistica* version 11 (StatSoft, 2012) was used to conduct an exploratory factor analysis with each one of the five questionnaires, assuming that the factors could be interrelated.

Results

The Social Phobia and Anxiety Inventory (SPAI)

An exploratory factor analysis (EFA) was conducted on the SPAI considering the sub-items as items, which meant considering its 109 component items (96 of Social phobia + 13 of Agoraphobia) without calculating the means of the items consisting of sub-items. The best factor solution for the SPAI (scree-test) revealed six factors with eigenvalues higher than 1.00 and a cumulative variance of 54.61%. Table 1 shows the six factors with inclusion in each one of them of some of the more representative items from the corresponding factor; that is, those that meet the following criteria: 1) a high loading in that factor (and in all cases higher than .40) and 2) they help to define the factor in operational terms. The six factors and the items pertaining to each one of them were as follows: Factor 1: *Interactions with the opposite sex/people in general* (items 1, 2, 3, 6, 9c, 9d, 10c, 10d, 11c, 11d, 12c, 12d, 15c, 15d, 16c, 16d, 17c, 17d, 18a, 18c, 18d, 19a, 19c, 19d, 22a, 22c, 22d); Factor 2: *Avoidance of/escape from social situations* (items 7, 8, 24a, 24b, 24c, 24d, 25a, 25b, 25c, 25d); Factor 3: *Drinking/writing in front of other people* (items 20a, 20b, 20c, 20d, 21a, 21b, 21c, 21d); Factor 4: *Negative thoughts/physiological symptoms* (items 26b, 26c, 26d, 26e, 27, 28, 30a, 30b, 30c, 30d, 31a, 31b, 31c, 32a, 32b, 32c, 32d, 32e); Factor 5: *Agoraphobic situations* (items 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45), and Factor 6: *Interactions with strangers/people in authority* (items 5, 9b, 10a, 10b, 11b, 12a, 12b, 13a, 13b, 14a, 14b, 15a, 15b, 16a, 16b, 17a, 17b, 18b, 19b, 22b, 23a, 23b, 23c, 23d). Items 4, 26a, and 29 did not load higher than .40 in any factor, while items 9a, 11a, 14c, and 14d had similar loadings in factors 1 and 6, so the statistical program did not assign them to any specific factor. The internal consistency (Cronbach's alpha) for the 109-item version of the SPAI was .984, and the Guttman split-half reliability was .974.

Table 1
Loadings and item-total correlations of representative items from each factor of the "Social Phobia and Anxiety Inventory" (SPAI) through exploratory factor analysis

Representative items of each factor of the SPAI	Factors						$r_{i\text{-}t}$
	F1	F2	F3	F4	F5	F6	
Factor 1. Interactions with the opposite sex/people in general (eigenvalue: 41.05; explained variance: 37.66%)							
9c. I feel anxious when in a small gathering with people of the opposite sex	**.67**	.23	.04	.26	.08	.20	.66
9d. I feel anxious when in a small gathering with people in general	**.66**	.31	.07	.31	.06	.21	.72
19c. I feel anxious when having to interact for longer than a few minutes with people of the opposite sex	**.66**	.26	.32	.13	.09	.24	.73
19d. I feel anxious when having to interact for longer than a few minutes with people in general	**.62**	.31	.31	.13	.09	.22	.72
Factor 2. Avoidance of/escape from social situations (eigenvalue: 5.54; explained variance: 5.08%)							
25a. I leave social situations where there are strangers	.14	**.82**	.06	.11	.13	.15	.53
25b. I leave social situations where there are authority figures	.04	**.79**	.09	.12	.14	.21	.51
25c. I leave social situations where there are people of the opposite sex	.25	**.75**	.16	.17	.13	.03	.56
25d. I leave social situations where there are people in general	.22	**.75**	.15	.15	.10	.00	.50
Factor 3. Drinking/writing in front of other people (eigenvalue: 4.03; explained variance: 3.70%)							
21a. I feel anxious when writing or typing in front of strangers	.14	.09	**.76**	.13	.13	.18	.52
21b. I feel anxious when writing or typing in front of authority figures	.07	.06	**.73**	.16	.09	.29	.51
21c. I feel anxious when writing or typing in front of people of the opposite sex	.17	.07	**.78**	.13	.12	.13	.52
21d. I feel anxious when writing or typing in front of people in general	.16	.11	**.76**	.17	.14	.10	.52
Factor 4. Negative thoughts/physiological symptoms (eigenvalue: 3.53; explained variance: 3.24%)							
26b. Before entering a social situation I think about all the things that can go wrong. The types of thoughts I experience are: I will probably make a mistake and look foolish	.22	.25	.15	**.58**	.12	.32	.67
26e. Before entering a social situation I think about all the things that can go wrong. The types of thoughts I experience are: People will notice how anxious I am	.22	.27	.16	**.63**	.11	.23	.66
31c. I experience the following prior to entering a social situation: heart palpitations	.24	.11	.14	**.71**	.08	.20	.62
32c. I experience the following in a social situation: shaking	.24	.17	.15	**.65**	.10	.18	.61
Factor 5. Agoraphobic situations (eigenvalue: 2.73; explained variance: 2.51%)							
35. I feel anxious when I am on any form of public transportation (e.g., bus, train, airplane)	.19	.16	.19	.12	**.62**	.03	.39

37. I feel anxious when I am in crowded public places (e.g., stores, church, movies, restaurants, etc.)	.23	.22	.17	.08	**.58**	.03	.40
39. I feel anxious when I am in enclosed places (e.g., elevators, tunnels, etc.)	.07	.13	.16	.09	**.62**	.08	.32
Factor 6. Interactions with strangers/people in authority (eigenvalue: 2.63; explained variance: 2.42%)							
13a. I feel anxious and I do not know what to do when in a situation involving confrontation with strangers	.40	.07	.06	.14	.10	**.60**	.64
13b. I feel anxious and I do not know what to do when in a situation involving confrontation with authority figures	.21	.04	.09	.17	.07	**.76**	.63
14a. I feel anxious and I do not know what to do when in an embarrassing situation with strangers	.41	.01	.02	.15	.08	**.65**	.64
14b. I feel anxious and I do not know what to do when in an embarrassing situation with authority figures	.24	.03	.11	.17	.05	**.77**	.65

Note: $r_{i\text{-}t}$= correlation item-total.

The Liebowitz Social Anxiety Scale-Self-Report version (LSAS-SR)

The best factor solution for the LSAS-SR overall produced eight factors with eigenvalues higher than 1.00 and a cumulative variance of 54.19%. Nevertheless, considering the small contribution made by the Avoidance subscale, given that the same item in its Anxiety and Avoidance variants tended to load in the same factor, we made the decision to consider solely the Anxiety subscale for this analysis. The best factorial solution for the LSAS-SR Anxiety subscale involved five factors, with a cumulative variance of 52.32%. Table 2 shows these factors, including some of the more representative items for each factor. The factors and the items pertaining to each one of them were as follows: Factor 1: *Interactions with strangers* (items 7, 10, 11, 12, 19, 21, and 23); Factor 2: *Speaking in public/Interactions with people in authority* (items 5, 6, 15, 16, 17, and 20); Factor 3: *Eating/drinking in front of other people* (items 3 and 4); Factor 4: *Working/writing/talking by phone in front of other people* (items 1, 8, and 9), and Factor 5: *Assertive behaviors* (items 22 and 24). Items 14 and 18 did not load higher than .40 in any factor, while item 13 had a similar load in factors 3 and 5, so the statistical program did not assign them to any specific factor. The internal consistency (Cronbach's alpha) for the LSAS-SR Anxiety subscale was .931, and the Guttman split-half reliability was .897.

The Social Phobia Inventory (SPIN)

The best factor solution for the SPIN involved three factors with eigenvalues higher than 1.00 and a cumulative variance of 57.63%. Table 3 presents these factors, including some of the more representative items for each factor. The three factors and the items pertaining to each one of them were as follows: Factor 1: *Criticism and embarrassment* (items 5, 12, 13, and 15); Factor 2: *Interactions with strangers* (items 3, 4, 8, and 10); Factor 3: *Speaking in public/Talking with people in authority/Being the center of attention* (items 1, 2, 6, 7, 9, 11, 16, and 17). Item 14 had a similar load in factors 1 and 3, so the statistical program did not assign

them to any specific factor. The internal consistency (Cronbach's alpha) for the SPIN was .913 and the Guttman split-half reliability was .923.

Table 2

Loadings and item-total correlations of representative items from each factor of the "Liebowitz Social Anxiety Scale-Self-Report" (LSAS-SR) through exploratory factor analysis

Representative items of each factor of the LSAS-SR	Factors					$r_{i\text{-}t}$
	F1	F2	F3	F4	F5	
Factor 1. Interactions with strangers (eigenvalue: 7.24; explained variance: 30.18%)						
11. Talking with people you don't know very well	**.72**	.29	.12	.10	.12	.63
12. Meeting strangers	**.76**	.17	.19	.07	.08	.60
Factor 2. Speaking in public/Interactions with people in authority (eigenvalue: 1.72; explained variance: 7.20%)						
5. Talking to people in authority	.12	**.65**	.13	.30	.01	.57
6. Acting, performing, or giving a talk in front of an audience	.18	**.75**	-.06	-.05	.07	.46
Factor 3. Eating/drinking in front of other people (eigenvalue: 1.34; explained variance: 5.57%)						
3. Eating in public places	.11	.14	**.73**	.11	.10	.40
4. Drinking with others in public places	.18	.03	**.74**	.22	-.08	.34
Factor 4. Working/writing/talking by phone in front of other people (eigenvalue: 1.19; explained variance: 4.96%)						
8. Working while being observed	.13	.38	.15	**.63**	.24	.60
9. Writing while being observed	.08	.17	.22	**.61**	.22	.48
Factor 5. Assertive behaviors (eigenvalue: 1.06; explained variance: 4.43%)						
22. Returning goods to a store	.38	-.02	.05	.17	**.60**	.46
24. Resisting a high pressure salesperson	.07	.21	-.06	.30	**.67**	.46

Note: $r_{i\text{-}t}$= correlation item-total.

Table 3

Loadings and item-total correlations of representative items from each factor of the "Social Phobia Inventory" (SPIN) through exploratory factor analysis

Representative items of each factor of the SPIN	Factors			$r_{i\text{-}t}$
	F1	F2	F3	
Factor 1. Criticism and embarrassment (eigenvalue: 7.11; explained variance: 41.84)				
5. Being criticized scares me a lot	**.81**	.17	.06	.50
12. I would do anything to avoid being criticized	**.83**	.05	.12	.51
Factor 2. Interactions with strangers (eigenvalue: 1.61; explained variance: 9.50)				
3. Parties and social events scare me	.16	**.71**	.25	.53
4. I avoid talking to people I don't know	.07	**.65**	.41	.57
Factor 3. Speaking in public/Talking with people in authority/Being the center of attention (eigenvalue: 1.07; explained variance: 6.28)				
1. I am afraid of people in authority	.42	.04	**.51**	.55
9. I avoid activities in which I am the center of attention	.07	.47	**.61**	.63
11. I avoid having to give speeches	-.01	.20	**.74**	.56

Note: $r_{i\text{-}t}$= correlation item-total.

The Social Phobia Scale (SPS)

The best factor solution for the SPS involved three factors with eigenvalues higher than 1.00 and a cumulative variance of 47.07%. Table 4 presents these factors, including some of the more representative items for each factor. The three factors and the items pertaining to each one of them were as follows: Factor 1: *Becoming nervous when being observed by other people* (items 1, 6, 11, 13, 16, 17, 18, and 19); Factor 2: *Being self-conscious in situations where overt behaviors are expressed* (items 2, 3, 9, and 10); and Factor 3: *Worrying about attracting attention* (items 4, 5, 7, 12, 14, 15, and 20). Item 8 did not load higher than .40 in any factor. The internal consistency (Cronbach's alpha) for the SPS was .872 and the Guttman split-half reliability was .903.

Table 4
Loadings and item-total correlations of representative items from each factor of the "Social Phobia Scale" (SPS) through exploratory factor analysis

Representative items of each factor of the SPS	Factors			$r_{i\text{-}t}$
	F1	F2	F3	
Factor 1. Becoming nervous when being observed by other people (eigenvalue: 6.34; explained variance: 31.70%)				
1. I become anxious if I have to write in front of other people	**.57**	.31	-.09	.28
13. I would get tense if I had to carry a tray across a crowded cafeteria	**.52**	-.05	.39	.52
16. When in an elevator, I am tense if people look at me	**.66**	-.00	.37	.56
Factor 2. Being self-conscious in situations where overt behaviors are expressed (eigenvalue: 1.71; explained variance: 8.56%)				
2. I become self-conscious when using public toilets	.16	**.69**	-.07	.23
3. I can suddenly become aware of my own voice and of others listening to me	-.09	**.69**	.31	.35
9. I get panicky that others might see me faint or be sick or ill	.07	**.44**	.41	.37
Factor 3. Worrying about attracting attention (eigenvalue: 1.36; explained variance: 6.81%)				
5. I fear I may blush when I am with others	.13	-.05	**.64**	.47
14. I worry I'll lose control of myself in front of other people	-.05	.12	**.73**	.47
15. I worry I might do something to attract the attention of other people	.14	.11	**.78**	.60

Note: $r_{i\text{-}t}$= correlation item-total.

The Social Interaction Anxiety Scale (SIAS)

The best factor solution for the SIAS involved three factors with eigenvalues higher than 1.00 and a cumulative variance of 51.55%. Table 5 presents these factors, including some of the more representative items for each factor. The three factors and the items pertaining to each one of them were as follows: Factor 1: *Worrying about criticism and embarrassment* (items 11, 12, 13, 14, 15, 16, 17, 18, and 19); Factor 2: *Easiness to interact with other people* (items 8 and 10); and Factor 3: *Difficulty to interact with other people* (items 1, 3, 4, 5, 6, 7, and 9). Item

2 did not load higher than .40 in any of the factors. The internal consistency (Cronbach's alpha) for the SIAS was .866 and the Guttman split-half reliability was .813.

Table 5

Loadings and item-total correlations of representative items from each factor of the "Social Interaction and Anxiety Scale" (SIAS) through exploratory factor analysis

Representative items of each factor of the SIAS	Factors			$r_{i\text{-}t}$
	F1	F2	F3	
Factor 1. Worrying about criticism and embarrassment (eigenvalue: 7.21; explained variance: 37.93%)				
11. I worry about expressing myself in case I appear awkward	**.68**	.15	.08	.48
14. I find myself worrying that I won't know what to say in social situations	**.71**	-.18	.34	.69
17. When mixing in a group, I find myself worrying I will be ignored	**.74**	-.12	.18	.61
Factor 2. Easiness to interact with other people (eigenvalue: 1.50; explained variance: 7.88%)				
8. I am at ease meeting people at parties, etc.	-.06	**.65**	-.31	-.25
10. I find it easy to think of things to talk about	-.08	**.77**	-.04	-.12
Factor 3. Difficulty to interact with other people (eigenvalue: 1.09; explained variance: 5.74%)				
4. I find difficulty mixing comfortably with the people I work with	.25	-.06	**.68**	.57
6. When mixing socially, I am uncomfortable	.20	-.14	**.81**	.61
9. I have difficulty talking with other people	.14	-.35	**.68**	.49

Note: $r_{i\text{-}t}$= correlation item-total.

Correlations between the different questionnaires

SPAI, LSAS-SR, and SPIN were related to one another, with Table 6 showing these correlations. As is to be expected, the LSAS-SR Avoidance subscale is the one recording the lowest correlations with all the other measures, while the correlations between the questionnaires' overall scores tended to be above .70. On the other hand, the correlation between SPS and SIAS was .75.

Table 6

Correlations among the SPAI, the LSAS-SR, and the SPIN (*N*= 486)

Self-report measures	SPAI Social phobia (96 items)	SPAI Social phobia -Agoraphobia	LSAS-SR Anxiety	LSAS-SR Avoidance	LSAS Total
SPAI Social phobia (96 items)	--	--	--	--	--
SPAI Social phobia-Agoraphobia	.93	--	--	--	--
LSAS-SR Anxiety	.73	.66	--	--	--
LSAS-SR Avoidance	.57	.50	.74	--	--
LSAS-SR Total	.70	.63	.93	.93	--
SPIN	.78	.70	.75	.63	.74

Note: SPAI= Social Phobia and Anxiety Inventory; LSAS-SR= Liebowitz Social Anxiety Scale-Self-Report version; SPIN= Social Phobia Inventory.

Differences in social anxiety between men and women

Table 7 shows the differences in social anxiety between men and women. The magnitude of the differences was small (Cohen's $d < 0.50$ and > 0.20), as tends to be the case when these analyses are made (e.g., Caballo *et al*., 2008; Caballo, Salazar, Irurtia *et al*., 2013), and could be seen in the SPAI, the LSAS-SR Anxiety subscale, and the SPIN. No significant differences were found between the sexes in the SPS and the SIAS.

Table 7
Differences between men and women in the scores of the five self-report social anxiety measures

Self-report measures	Men *M* (*SD*)	Women *M* (*SD*)	*t*	*p*	*d*
SPAI Social phobia (96 ítems)	292.14 (93.57)	318.45 (90.98)	3.75	**.0002**	0.28
SPAI Social phobia - Agoraphobia	71.46 (27.20)	77.48 (26.65)	2.96	**.0032**	0.22
LSAS-SR Anxiety	22.57 (10.08)	26.02 (10.74)	3.23	**.0013**	0.33
LSAS-SR Avoidance	19.62 (10.70)	19.70 (10.74)	0.08	.9383	--
LSAS-SR Total	42.19 (19.02)	45.73 (19.82)	1.78	.0752	--
SPIN	18.48 (11.46)	22.78 (12.27)	3.46	**.0006**	0.36
SPS	23.22 (11.43)	25.26 (11.83)	0.97	.3311	--
SIAS	25.46 (11.16)	26.52 (11.33)	0.52	.6000	--

Note: SPAI= Social Phobia and Anxiety Inventory; LSAS-SR= Liebowitz Social Anxiety Scale-Self-Report version; SPIN= Social Phobia Inventory; SPS: Social Phobia Scale; SIAS: Social Interaction Anxiety Scale.

Discussion

The factor analyses of the five self-report measures most widely used internationally for assessing social anxiety (LSAS-SR, SPAI, SPIN, SPS, and SIAS) will be discussed in the context of results from recent studies with the "Social Anxiety Questionnaire for Adults" (SAQ-A30) (Caballo, Salazar, Arias *et al*., 2010; Caballo, Salazar, Irurtia *et al*., 2012; Caballo, Arias *et al*., 2013). The SAQ-A30 has established a basic structure for social anxiety based on five dimensions *(Interactions with the opposite sex, Speaking in public/Talking with people in authority, Criticism and embarrassment, Interactions with strangers,* and *Assertive expression of annoyance, disgust or displeasure).* First, we found similarities in the factor structure among some of the questionnaires analyzed in this study, as well as with the factor structure of the SAQ-A30. For example, the factor "Interactions with strangers" features in the SPAI, the LSAS-SR, and the SPIN, appearing also in

the SAQ-A30. It would seem that this dimension is generally considered essential for the social anxiety construct.

The factor "Speaking in public/Talking with people in authority" also appears to attract a significant consensus, as it is to be found in the LSAS-SR, the SPIN, and the SPAI (in this last case, sharing the same factor with "Interactions with strangers"), and as was the case with the first previous factor, it likewise appears in the SAQ-A30. The third factor, called "Interactions with the opposite sex," appears solely in the SPAI and the SAQ-A30. The absence of this factor in the other questionnaires is because they do not have items to assess it. This is surprising if, as seen in the studies with the SAQ-A30, "Interactions with the opposite sex" constitutes a basic dimension of social anxiety, not only in adults (Caballo, Salazar, Irurtia *et al*., 2010, Caballo, Salazar, Arias *et al.,* 2010b; Caballo, Salazar *et al*., 2012; Caballo, Arias *et al*., 2013) but also in children (Caballo, Arias *et al*., 2012). A possible explanation might be that referring to the "opposite sex" is not politically correct and researchers have preferred to avoid it. Another possible explanation might be that the construct of social anxiety has not been sufficiently explored, although the fact that in our studies this dimension appears so obvious when considering the structure of social anxiety that it is difficult to understand why the factor "Interactions with the opposite sex" does not appear as a key dimension in the literature on the assessment of social anxiety.

The factor "Criticism and embarrassment" is present in the SPIN, the SIAS and also in the SAQ-A30. Studies on this last self-report measure have found that that factor constitutes a basic fourth dimension of the structure of social anxiety. Finally, the factor "Assertive expression of annoyance, disgust or displeasure" appears solely in the LSAS-SR and the SAQ-A30, being the fifth dimension that forms the basic structure of social anxiety. In short, the five key dimensions of the SAQ-A30 are supported by one or other questionnaire used internationally for assessing social anxiety, although some of the dimensions receive more support than others.

Nevertheless, it is important to note that the SPS and the SIAS take different paths from those followed by all the other instruments. Their factors reflect more cognitive aspects of social anxiety (especially when the item includes terms such as "I worry", "I become aware" or "I feel self-conscious"), and some of their items do not appear to be clearly understood by the university students (we assume that this would become even more of a problem among individuals from the general population). For example, when the items refer to "I feel self-conscious" those individuals completing the SPS often do not understand what those items mean exactly, and this might have a bearing on the questionnaire's overall score, particularly if there are persons with social anxiety who are afraid to ask. It is likely that this way of formulating the items may explain why its factorial structure is very different to all the other questionnaires, for although the SIAS includes situations with people in authority, strangers or the opposite sex, the resulting factors do not reflect those types of situations. Two of its three factors reflect the easiness or difficulty in relating to others. In the case of the factor referring to "Easiness to interact with other people", its two items have a positive formulation ("I am at ease…", "I find it easy…"), in contrast to all the other items in the

questionnaire. It is reasonable to suppose that two factors address the same kind of situations, albeit one uses positive expressions and the other uses negative ones ("I have difficulty…", "I become tense…"). When we analyze the SIAS further, we realize that the situations in factors 1 and 3 are very similar, and what seems to differentiate them (and that may be why they appear as different factors) is the initial formulation of the items, which seems to be more cognitive in factor 1 ("I worry…", "I find myself…") and more emotional in factor 3 ("I feel…").

As regards the SPS, the 20 items and three factors focus on being observed by other people, which means there would be no need for so many situations assessing the same concept (this may explain why a new six-item version has been considered, SPS-6, with the same reason applying to the SIAS, with the proposal of a new SIAS-6 [Peters *et al.*, 2012]). There do not appear to be any major differences between factors 1 and 2 in the SPS, so they could easily constitute a single factor. The main difference between these two factors and the third one is that the items in the latter focus on the cognitive concept of "worrying", somewhat akin to the case of the factors of the SIAS, albeit not in the type of situations they address. Finally, the majority of items in both the SPS and the SIAS do not specify the target audience (strangers, opposite sex, people in authority), being expressed in a very general manner ("people", "other people", "others"), an aspect that leaves to the imagination of the individual answering these two questionnaires the type of specific persons attributed these overly general definitions. Regarding the SPS, our three-factor solution reveals a certain coincidence with the proposal made by Mattick and Clarke (1998) in two factors: one that covers the general concern about being judged or observed (which in our case corresponds to "Becoming nervous when being observed by other people"), and the other refers to appearing to be ill, strange or losing control in front of others (in our case, "Worrying about attracting attention"). As regards the SIAS, we should stress that our three-factor solution is totally different to what has been reported in other studies, where there is a prevalence of one-factor solutions, whether analyzed on a single basis (e.g., Mattick & Clarke, 1998) or jointly with the SPS (e.g., Carleton *et al*., 2009; Osman *et al*., 1998), or two-factor solutions (when analyzed jointly with the SPS, as in the study by Habke *et al*. 1997).

When we examine the other three questionnaires in more depth, we encounter several aspects that could benefit from improvement. For example, in the factor analysis of the SPAI the items intercorrelate, in many cases, depending on the specific kind of people they address, which means there does not seem to be much sense in grouping the sub-items from item 9 through to 25 and calculating their mean score. For example, item 10a, "I feel anxious when in a crowded meeting with strangers", is grouped with 12a, "I feel anxious and I do not know what to do when in a new situation with strangers", and there on successively (13a, 14a, etc.) The same occurs with item 10b, "I feel anxious when in a crowded meeting with people in authority", is grouped with 12b, "I feel anxious and I do not know what to do when in a new situation with people in authority", and there on successively (13b, 14b, etc.) These two types of items form factor 6, "Interactions with strangers/people in authority". Something similar occurs with items 10c, 11c, 12c, etc. and items 10d, 11d, 12d, etc., constituting

factor 1, "Interactions with the opposite sex/people in general". For those people answering the questionnaire, this means the kind of people included in the item (e.g., "people in authority", "opposite sex", "strangers") is the key aspect of the situation and more important than the type of behavior performed with that person ("small meeting", "crowded meeting", "being at a bar or at a restaurant", "new situation", etc.) We therefore question the decision by the questionnaire's authors to consider the mean score of the four sub-items that make up items 9 to 25. In fact, this decision means the only valid score is the overall score for the SP subscale (sum of items 1 to 32), when the actual number of answers corresponds to 96 items/sub-items, which as we have done in this study would provide specific information on at least three of the five basic dimensions of social anxiety (SAQ-A30), as are "Interactions with the opposite sex", "Interactions with strangers", and "Interaction with people in authority" (Caballo, Salazar, Arias *et al*., 2010; Caballo, Salazar *et al*., 2012). Nevertheless, there do not appear to be any factors related to the dimensions "Criticism and embarrassment" and "Assertive expression of annoyance, disgust or displeasure". On the other hand, there are items that do not appear to be very relevant. For example, item 17, "I feel anxious when talking of business with…", is generally not applied when the questionnaire is completed by university students, or item 15, "I feel anxious when talking of intimate feelings with…", seems inappropriate when referring to "strangers", "people in authority", or "people in general". In turn, the situations of "Drinking/writing in front of other people", which alone form factor 3, do not appear to be relevant for Latin America, Spain, and Portugal, as we have shown in recent studies (Caballo, Salazar, Irurtia *et al*., 2010; Caballo, Salazar *et al*., 2012). Factor 4, related to "Negative thoughts/physiological symptoms", does not appear to be of any great use for assessing social anxiety given the large number and variety of negative thoughts and physiological symptoms recorded among individuals suffering from social anxiety. The questionnaire contains only nine thoughts and five physiological symptoms. It is therefore likely that the item "palpitations/racing heart" records a high score for most individuals with social anxiety, but we doubt the same thing occurs with the item "frequent urges to urinate". We do not find any use either for the subscale devoted to agoraphobic situations (items 33 to 45), which make up factor 5, as it needlessly extends the questionnaire and does not appear to provide any additional information of importance for identifying someone with social anxiety, as reported by Herbert, Bellack, and Hope (1991).

In addition, we note that our six-factor solution for the SPAI contrasts with the two-factor solutions reported in the literature when analyzing all the items in the inventory (e.g., Baños *et al*., 1997; Turner, Stanley *et al*., 1989), as well as to those that analyze solely the SP subscale (e.g., Osman *et al*., 1995; Turner, Stanley *et al*., 1989). There is no doubt that more studies on its factorial structure are needed. Finally, the beginning of most of the items, "I feel anxious…", does not appear to be readily understood by those who complete the questionnaire in Spanish. There is at least a clarification in the questionnaire's instructions, "*feeling anxious* is a measure of how you feel tense, nervous, or uneasy in social contacts".

Regarding the LSAS-SR, there does not seem much point in duplicating the 24 items so that after responding to the fear or anxiety each situation causes one has to respond again to the frequency of avoidance regarding each situation. In the exploratory factor analysis we conducted initially with this questionnaire, the item whose answer was based on avoidance usually loaded on the same factor as the corresponding item whose answer was based on the fear or anxiety felt. The frequency data for each item do not appear to add more information than data associated with the fear or anxiety (e.g., Oakman *et al*., 2003). Accordingly, and consistent with the results of the factor analysis, we consider here solely the subscale related to fear or anxiety, with the outcome being clearer and more consistent factors. Of the five factors found in the LSAS-SR, three coincide fully with those that make up the basic structure of social anxiety (SAQ-A30), namely, "Interactions with strangers" (factor 1), "Speaking in public/Talking with people in authority" (factor 2), and "Assertive behaviors" (factor 5). The other two factors, particularly factor 3, "Eating/drinking in front of other people", do not appear to have any special relevance to populations in Latin America, Spain, and Portugal, as we noted when dealing with the SPAI. This may be due to a cultural difference between the English-speaking world and the aforementioned Latin countries. Additionally, the studies conducted to date have not sufficiently explored the assessment of social anxiety with a view to determining whether or not they are basic dimensions of social anxiety. Nevertheless, we should stress that the numerous empirical studies conducted to develop the SAQ-A30 do not provide any evidence to show that factors 3 and 4 in the LSAS-SR are relevant for measuring social anxiety in Iberoamerican countries.

Finally, we note that this last questionnaire does not include the dimensions "Interactions with the opposite sex" and "Criticism and embarrassment", mainly because it does not have any items that refer to this latter dimension or it has only one item regarding interaction with the opposite sex (or at least this is what people understand) (item 21, "Trying to pick up someone"). When comparing this work with prior studies that have explored the factor structure of the LSAS-SR, we note that our work coincides more closely with the 5-factor solution proposed by Baker *et al*. (2002), thus: *Social interaction* (in our study, "with strangers"), *Non-verbal performance* (in our study, "Working/writing/talking by phone in front of other people"), *Ingestion* (in our study, "Eating/drinking in front of other people"), *Performing in public* (in our study, "Speaking in public"), and *Assertiveness* (in our study, "Assertive behaviors").

Regarding the SPIN, the three factors found correspond to the three basic dimensions of social anxiety following the SAQ-A30, namely, "Criticism and embarrassment" (factor 1), "Interactions with strangers" (factor 2), and "Speaking in public/Talking with people in authority" (factor 3). Nevertheless, the dimensions "Interactions with the opposite sex" and "Assertive expression of annoyance, disgust or displeasure" do not appear, basically because the questionnaire do not include items of this nature. This omission restricts the questionnaire's use, as it leaves these two important areas of social anxiety out of the assessment. A further limitation involves the instructions, as the assessment focuses solely on the situations that have taken place over the preceding week, which is hard to

reconcile with the chronic difficulties in social situations experienced by individuals suffering from social anxiety. A comparison between our 3-factor solution of the SPIN and those reported in the literature (e.g., Osório *et al*., 2010; Radomsky *et al*., 2006) reveals no major agreements, with the exception of Osório *et al*. (2010), where there is a similarity in the main factor that encompasses *Fear and avoidance of situations of social evaluation* (in our study, "Criticism and embarrassment").

As far as the relationships between these different questionnaires are concerned, we should note that there are strong agreements among the SPAI, the LSAS-SR, and the SPIN, which appear to measure the same construct of overall social anxiety. There is less agreement among these instruments on the dimensions (factors) of social anxiety assessed. Only two dimensions, "Interactions with strangers" and "Speaking in public/Talking with people in authority" (the latter with limitations), would seem to be associated with a reasonable degree of consensus across the three instruments.

Finally, regarding the differences associated with sex, the results are consistent with those reported in other recent studies (Caballo *et al*., 2008; Caballo, Salazar, Irurtia *et al*., 2013) and those featured in the literature (e.g., APA, 2013; Baños *et al*., 2007; Gültekin & Dereboy, 2011; Hirai, Vernon, Clum, & Skidmore, 2011; Olivares *et al*., 2001; Turk *et al*., 1998; Vieira, Salvador, Matos, García-López, & Beidel, 2013), where clear but small differences are found. The absence of significant differences between men and women on the LSAS-SR Avoidance subscale is also consistent with recently collated data (Caballo, Salazar, Irurtia *et al*., 2013). This lack of significant differences in the SPIN, the SPS, and the SIAS is also to be found in the literature (e.g., Eggleston *et al*., 2004; Hirai *et al*., 2011; Stewart & Mandrusiak, 2007; Olivares *et al*., 2001).

We also draw attention to some of the limitations of this study. One of them is that the samples used involve nonclinical populations, more specifically participants from university environments. Although factor solutions tend to be clearer with general population, the use of clinical samples would have enriched our study. Second, the sample of individuals who filled the SPS and the SIAS is small and different from the samples used for the other three questionnaires (so we have not been able to find a relationship between the two former ones and the latter three). However, the SPS and the SIAS head in different directions from the other instruments, and the phrasing of some of their items renders them difficult to understand in Spanish and Portuguese.

To conclude, we stress that the three questionnaires at the heart of our study, namely, the SPAI, the LSAS-SR, and the SPIN, have similarities (they share some of the dimensions of social anxiety and have a high correlation between their overall scores) as well as differences (there are dimensions they do not share). We posit that the SAQ-A30 (Caballo, Salazar, Arias *et al*., 2010; Caballo, Salazar *et al.,* 2012; Caballo, Arias *et al.,* 2013), with its five-factor structure, would be a more comprehensive self-report measure, obtained empirically, providing a solid base for establishing the definitive structure, and the assessment, of the construct of social anxiety.

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