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The Liebowitz Social Anxiety Scale: a comparison of the psychometric properties of self-report and clinician-administered formats

D. M. FRESCO, M. E. COLES, R. G. HEIMBERG,[1] M. R. LIEBOWITZ, S. HAMI, M. B. STEIN AND D. GOETZ

From the Adult Anxiety Clinic of Temple University, Philadelphia, PA; Anxiety Disorders Clinic, New York State Psychiatry Institute, and Department of Psychiatry, Columbia University, New York, NY; and Department of Psychiatry, University of California San Diego, CA, USA

ABSTRACT

Background. The clinician-administered version of the Liebowitz Social Anxiety Scale (LSAS-CA) is a commonly used assessment device for the evaluation of social anxiety disorder and has been shown to have strong psychometric characteristics. Because of its apparently straightforward rating format and potential savings in time and effort, interest in the use of the LSAS as a self-report (LSAS-SR) measure has increased, and the LSAS-SR has been used in a number of studies. However, the psychometric properties of the LSAS-SR have not been well established.

Methods. This study examined the psychometric properties of the LSAS-SR in comparison to the LSAS-CA in a sample of 99 individuals with a primary diagnosis of social anxiety disorder and 53 individuals with no current psychiatric disorder.

Results. There was little difference between the two versions of the LSAS on any scale or subscale score. Both forms were internally consistent and the subscale intercorrelations for the two forms were essentially identical. Correlations of each LSAS-SR index with its LSAS-CA counterpart were all highly significant. Finally, the convergent and discriminant validity of the two forms of the LSAS was shown to be strong.

Conclusion. Results of this study suggest that the self-report version of the LSAS compares well to the clinician-administered version and may be validly employed in the assessment of social anxiety disorder.

INTRODUCTION

Although social anxiety disorder (or social phobia as it is also known) was once regarded as the 'neglected anxiety disorder' (Liebowitz *et al.* 1985), tremendous progress has been made in refining its diagnostic criteria, reliably assessing its symptoms and associated impairments, and developing medication and psychosocial treatments (Heimberg *et al.* 1995; Stein 1995).

Social anxiety disorder is the third most common psychiatric disorder with a lifetime prevalence of 13·3% (Kessler *et al.* 1994). It is associated with significant impairment in social, educational and vocational functioning (Liebowitz *et al.* 1985). Social anxiety disorder can interfere with any facet of life that evokes the spectre of evaluation by others, such as the ability to initiate or maintain social or romantic relationships, attend classes that require participation in discussion, take part in meetings at the workplace, or join social or recreational groups (Schneier *et al.* 1994). Individuals with social anxiety disorder are less likely to be married, more likely to terminate their education early, more likely to be unproductive at work or

[1] Address for correspondence: Professor Richard G. Heimberg, Adult Anxiety Clinic of Temple University, Temple University, 419 Weiss Hall, 1701 North 13th Street, Philadelphia, PA 19122-6085, USA.

miss work because of their social anxiety, and more likely to receive financial assistance than persons without the disorder (Schneier *et al.* 1992; Stein *et al.* 1999). Social anxiety disorder is also highly co-morbid with other disorders that produce significant impairment in functioning, such as depression and alcoholism (Schneier *et al.* 1992; Kessler *et al.* 1999). Not surprisingly, individuals with social anxiety disorder rate their quality of life as very low (Safren *et al.* 1997).

To further our understanding of social anxiety disorder, and to evaluate the efficacy of both medication and psychotherapy treatments, it is necessary to assess reliably levels of fear and avoidance in social and performance situations. The Liebowitz Social Anxiety Scale (LSAS; Liebowitz 1987) is a clinician-administered scale that assesses fear and avoidance in 24 situations that are likely to elicit social anxiety. Thirteen of the items enquire about performance situations (e.g. giving a report to a group, eating in public places) while the remaining 11 situations assess social interaction situations (e.g. going to a party, meeting strangers). For each of the 24 situations, clinicians derive ratings of fear and avoidance experienced by the respondent in the past week using 0–3 Likert-type scales. Six subscales can be derived from the ratings: Fear of Social Interaction, Fear of Performance, Avoidance of Social Interaction, Avoidance of Performance, Total Fear and Total Avoidance. An overall total score may also be derived by summing the fear and avoidance ratings for all items. The LSAS has been used in most clinical trials of medications for social anxiety disorder (Lott *et al.* 1997; Noyes *et al.* 1997; Stein *et al.* 1998) and it is being used with increasing frequency in studies evaluating the efficacy of cognitive–behavioural treatments as well (e.g. Heimberg *et al.* 1998).

We recently reported on the psychometric properties of the clinician-administered LSAS (Heimberg *et al.* 1999*a*). Specifically, we evaluated the reliability, convergent and discriminant validity, and treatment sensitivity of the LSAS in a sample of 382 individuals who sought treatment and met diagnostic criteria for social anxiety disorder. The LSAS proved to be highly reliable, with Cronbach's (1951) alphas ranging from 0·81 for the Fear of Performance subscale to 0·96 for the LSAS Total Score. The LSAS also demonstrated strong convergent validity. The LSAS total and subscale scores were positively correlated with both self-report and clinician-administered measures of social anxiety. The LSAS also showed adequate discriminant validity by demonstrating significantly stronger correlations with measures of social anxiety than with measures of depression in a subsample of patients who had completed acute treatment. Finally, the LSAS demonstrated strong treatment sensitivity, with robust effect sizes for treated patients on all LSAS indices, both within active treatment and in comparison to placebo-treated patients. These data provide important justification for the use of the LSAS as a reliable, valid and treatment-sensitive clinician-administered assessment of social anxiety disorder.

Although the LSAS is a clinician-administered measure, the ratings applied by the clinician are relatively straightforward. The patient is provided with the scale anchors and picks the most appropriate response to each situation as presented by the clinician. The clinician simply records these ratings, although he/she may probe further if the patient's response is inconsistent with other available information. Consequently, because of potential savings in time and effort, the LSAS has also been adapted to self-report format, and a self-report version of the LSAS was recently used in a multicentre pharmaceutical trial (Baldwin *et al.* 1999). However, only two studies have examined the psychometric characteristics of a self-report version of the LSAS (LSAS-SR; Cox *et al.* 1998) or a computer-administered version (Kobak *et al.* 1998) of the LSAS. In the study by Cox *et al.* the LSAS-SR demonstrated convergent and discriminant validity similar to other measures of social anxiety disorder. However, it was less reliable ($\alpha s \geqslant 0{\cdot}70$) than reported for the clinician-administered version ($\alpha s \geqslant 0{\cdot}81$) by Heimberg *et al.* (1999*a*), and with the exception of the Avoidance of Performance subscale, demonstrated less sensitivity to the effects of cognitive–behavioural treatment than did other measures of social anxiety disorder. Cox *et al.* (1998) expressed caution in using the LSAS in a self-report format until more research on its psychometric properties had been conducted. It is possible that the modest alphas and treatment sensitivity of this version of the LSAS-SR were

the result of the fact that participants were not given clear instructions on how to complete the LSAS-SR. Kobak *et al*. (1998) compared a clinician-administered LSAS to a computer-administered LSAS in 44 out-patients with social anxiety disorder. Participants completed both versions on the same day with the clinician-administered version given first. The two versions of the LSAS were highly internally consistent (αs = 0·94 for computer-administered; 0·93 for clinician-administered), highly correlated ($r = 0{\cdot}94$), and they produced similar mean scores. However, the similarity between scores may have been an artefact of the brief time between administrations and the ease with which patients could remember their responses from one administration to the next (Heimberg *et al*. 1999*b*). The current study examined the psychometric properties of a self-report version of the LSAS in a sample of individuals with social anxiety disorder who received clear and detailed instructions for completing the LSAS-SR. We also compared the psychometric properties of the self-report and clinician-administered versions of the LSAS.

METHOD

Participants

Participants were 99 individuals seeking treatment for social anxiety disorder at one of three clinics (the Adult Anxiety Clinic of Temple University (Temple, $N = 49$), the Anxiety Disorders Clinic of the New York State Psychiatric Institute (NYSPI, $N = 14$) and the Anxiety and Traumatic Stress Program of the University of California, San Diego (UCSD, $N = 36$)), and 53 individuals with no current Axis I disorders (Temple, $N = 36$; UCSD, $N = 17$) who served as a control group. All individuals with social anxiety disorder met DSM-IV (American Psychiatric Association 1994) criteria for this disorder as a primary diagnosis as assessed by structured diagnostic interview. Non-anxious controls at Temple were recruited from the community via newspaper advertisements and flyers and were selected to be demographically similar to the Temple social anxiety patients. Non-anxious controls from San Diego responded to a solicitation posted on the UCSD website and were matched to UCSD patients on age, gender and ethnicity. Non-anxious participants at either site received $40US for the completion of a larger battery of assessments. All participants at Temple were assessed with the Anxiety Disorders Interview Schedule-Lifetime Version for DSM-IV (Di Nardo *et al*. 1994). Participants at NYSPI and UCSD were assessed with the Structured Clinical Interview for DSM-IV (First *et al*. 1994).

Clinician-administered measures

The Liebowitz Social Anxiety Scale: Clinician-Administered Version (*LSAS-CA*) (Liebowitz, 1987)

The LSAS is a 24-item scale providing separate scores for fear and avoidance in social and performance situations over the past week. As reviewed above, Heimberg *et al*. (1999*a*) found the LSAS-CA to possess high internal consistency, strong correlations with measures of social anxiety, lesser correlations with measures of depression and excellent sensitivity to treatment effects. For this study, clinicians instructed patients to respond according to the instructions for the self-report version of the scale (see below).

Hamilton Rating Scale for Depression (*HRSD-21*) (Hamilton 1960)

The 21-item scale was used in this study. The HRSD was not administered at UCSD.

Self-report measures

Liebowitz Social Anxiety Scale: Self-Report Version (*LSAS-SR*)

The following instructions were read to the patient and reiterated as necessary: (1) this measure assesses the way that social phobia plays a role in your life across a variety of situations; (2) read each situation carefully and answer two questions about that situation; (3) the first question asks how anxious or fearful you feel in the situation; (4) the second question asks how often you avoid the situation; (5) if you come across a situation that you ordinarily do not experience, we ask that you imagine 'what if you were faced with that situation', and then rate the degree to which you would fear this hypothetical situation and how often you would tend to avoid it. Please base your ratings on the way that the situations have affected you in the last week.

Social Interaction Anxiety Scale (*SIAS*)[1]† *and Social Phobia Scale* (*SPS*) (Mattick & Clarke, 1998)

The SIAS and SPS are companion scales that assess fears of social interaction in dyads and groups and fears of being scrutinized during routine activities (e.g. eating, drinking, writing), respectively. Each scale contains 20-items rated on 0-to-4 Likert-type scales, yielding total scores between 0 to 80. Both scales have been shown to be internally consistent (αs = 0·88 to 0·94) and stable over time (re-test coefficients > 0·90; Mattick & Clarke, 1998). Both scales discriminate well between individuals with social anxiety disorder, persons with other anxiety disorders, and community volunteers (Heimberg *et al.* 1992; Brown *et al.* 1997; Mattick & Clarke, 1998).

Social Phobia subscale of the Fear Questionnaire (*FQ-S*) (Marks & Mathews, 1979)

This is a widely used five-item measure of fear-motivated avoidance. In a sample of anxiety disorder patients, Oei *et al.* (1991) found the FQ-S to have adequate reliability ($\alpha = 0{\cdot}74$) and to distinguish patients with social anxiety disorder from those with other anxiety disorders. The Fear Questionnaire was not administered at UCSD.

Beck Depression Inventory (*BDI*) (Beck *et al.* 1979)

This is a 21-item self-report measure used to determine the presence and severity of depressive symptoms especially cognitive, motivational, affective and somatic aspects of the disorder. The BDI score is computed by summing the values for all 21 items. Internal consistency of the BDI is excellent in both clinical ($\alpha = 0{\cdot}86$) and non-clinical ($\alpha = 0{\cdot}81$) samples, and test–retest reliability is also high (Beck *et al.* 1988). The BDI is also a valid measure of depressive symptoms in both psychiatric and normal samples (Bumberry *et al.* 1978; Kendall *et al.* 1987; Beck *et al.* 1988). Coles *et al.* (2001) recently reported that the BDI demonstrated strong internal consistency ($\alpha = 0{\cdot}89$) and retest reliability ($r = 0{\cdot}84$) in patients with social anxiety disorder.

† The notes will be found on p. 1034.

Procedure

All measures were administered prior to the initiation of treatment for the clinical sample. Sixty-eight social anxiety disorder patients received the LSAS-CA first; 29 received the LSAS-SR first. Two participants received both measures on the same day. Seventeen non-anxious control participants received the LSAS-CA first, and 36 received the measures on the same day. Although random or counterbalanced assignment of participants to order of LSAS administration and systematic manipulation of the interval between administrations would have been optimal, it was not possible to do so in this study. The number of days between administrations for patients ranged from 0 to 329 with an average of 21. The number of days between administration for control participants ranged from 0 to 48 with an average of 3. Sixty-four per cent of participants received the two administrations within a 30-day period.

RESULTS

Analyses were conducted separately for individuals with social anxiety disorder and for control participants. Unless otherwise stated, each subsequent section presents results for individuals with social anxiety disorder first, followed by results for controls. In the analyses that follow, *N*s and degrees of freedom vary as a function of missing data or non-administration of a measure at one of the sites.

Preliminary analyses

Demographic analyses

Analyses of demographic characteristics failed to reveal differences between individuals with social anxiety disorder and control participants on age, race, sex, marital status, or education. However, demographic differences emerged among patients from the three study sites. UCSD patients were older ($F(2, 151) = 11{\cdot}93$, $P < 0{\cdot}001$), more likely to be married ($\chi^2(8) = 47{\cdot}44$, $P < 0{\cdot}001$), and less likely to be African American ($\chi^2(8) = 43{\cdot}42$, $P < 0{\cdot}001$) than patients at NYSPI or Temple. The only demographic variable in which controls differed was marital status. Participants from UCSD were more likely than Temple participants to

Table 1. *Demographic characteristics of social anxiety disorder patients and non-anxious controls as a function of study site*

	Patients ($N = 99$)			Non-anxious controls ($N = 53$)	
	Temple	NYSPI	UCSD	Temple	UCSD
Sex					
Men	27	9	21	19	9
Women	22	5	15	17	8
Race					
White	24	6	31	22	15
Black	16	3	0	10	1
Latino	4	3	5	1	1
Other	5	2	0	3	0
Education					
High School or less	5	4	2	7	1
Some college	20	4	9	7	5
College graduate	16	3	6	14	6
Post-graduate	8	3	10	8	5
Marital status					
Single	37	12	11	28	9
Married	7	1	16	2	6
Separated/divorced/widowed	5	0	3	6	2

*N*s differ within the table because of missing data.

be married ($\chi^2(3) = 22{\cdot}8$, $P = < 0{\cdot}001$), see Table 1.

Differences in response to the LSAS-CA and LSAS as a function of site

The next set of analyses compared LSAS-CA and LSAS-SR subscales and total scores to see if there were differences as a function of site. Among social anxiety disorder patients, analyses of all but one LSAS-CA scale score (Fear of Social Interaction) produced significant omnibus F tests.[2] In each case where differences were found, simple pairwise comparisons revealed that NYSPI patients scored significantly lower than UCSD patients. Temple social anxiety disorder patients did not differ from either NYSPI or UCSD patients. No site differences were found for any score among patients completing the LSAS-SR. No LSAS-SR scales and only one LSAS-CA scale revealed a difference between non-anxious control participants from different sites. UCSD control participants scored significantly higher than Temple control participants on the Avoidance of Performance subscale of the LSAS-CA.

Demographic effects on response to LSAS-CA and LSAS-SR

Given that patients from the three sites differed to a degree on the LSAS-CA and on demographic characteristics as well, further analyses were conducted to determine whether any of the demographic variables influenced response to the LSAS-CA or LSAS-SR. A set of two simultaneous multiple regression analyses that regressed patients' LSAS-CA Total Score and LSAS-SR Total Score onto race, age, and marital status revealed that only race was a significant predictor of LSAS Total Scores. A follow-up Race (3: White, African American, Latino) by Method of Administration of the LSAS (2: Clinician-Administered *v*. Self-Report) repeated measures analysis of variance (ANOVA) revealed a significant interaction ($F(2, 87) = 3{\cdot}47$, $P < 0{\cdot}05$). To examine this interaction, patients were grouped by race, and three Bonferroni-corrected, paired-sample t tests were conducted. These analyses revealed that African American participants were more likely to endorse social anxiety on the LSAS-SR than the LSAS-CA ($t(18) = 3{\cdot}82$, $P < 0{\cdot}001$). White and Latino patients did not score differently on the two LSAS measures with mean differences of less than 1, see Table 2. In the case of non-anxious controls, two one-way ANOVAs failed to reveal group differences as a function of Marital Status (3: Single, Married, Separated/Widowed/Divorced) for LSAS-CA Total Score ($F(2, 50) = 1{\cdot}15$, NS) or LSAS-SR Total ($F(2, 50) = 0{\cdot}81$, NS).

Table 2. *Means (and standard deviations) of the clinician-administered (CA) and self-report (SR) Liebowitz Social Anxiety Scale (LSAS) total scores for social anxiety disorder patients as a function of race and results of paired-sample* t *tests comparing the two versions within each race*

Race	LSAS-CA	LSAS-SR	*t*
White ($N = 59$)	75·94 (20·25)	75·22 (19·52)	$t(58) = 0{\cdot}47$
African American ($N = 19$)	72·47 (15·08)	80·58 (16·54)	$t(18) = 3{\cdot}82$*
Latino ($N = 12$)	87·08 (22·25)	87·58 (25·09)	$t(11) = -0{\cdot}08$

*$P < 0{\cdot}05$. Nine patients were not included in these analyses because they did not report their ethnicity ($N = 5$) or reported their ethnic background as 'other' ($N = 4$).

Order of administration and spread effects

The effects of order of administration and time between administrations of the LSAS-CA and LSAS-SR were also assessed among patients. Difference scores were computed by subtracting the LSAS-CA scale score from its LSAS-SR counterpart. A series of one-way ANOVAs failed to reveal differences between patients receiving the LSAS-CA first and patients receiving the LSAS-SR first.

Next, the number of days between administrations was considered. The absolute number of days between administrations of the LSAS-SR and LSAS-CA was computed, and participants were grouped into three categories: 1–14 days, 15–60 days, and $\geqslant 60$ days. Groups did not differ on either the LSAS-CA or LSAS-SR Total Score. However, the number of days between administrations was related to differences in LSAS subscale scores across the two methods of administration. A series of one-way ANOVAs revealed significant differences between LSAS-CA and LSAS-SR for the Avoidance of Social Interaction and Total Avoidance subscales; non-significant trends ($P < 0{\cdot}10$) were also found for Fear of Social Interaction and Fear of Performance. Follow-up analyses revealed significant differences on those scales for individuals with greater than 60 days between administrations. In general, respondents endorsed more social anxiety at the first administration irrespective of whether the format was self-report or clinician-administered.

Internal consistency

Internal consistency of the LSAS Total Score and subscale scores was evaluated with Cronbach's alpha. Table 3 presents the alpha coefficients for the subscales and Total Score for both versions of the LSAS. Among individuals with social anxiety disorder, alpha for the Total Score for both forms of the LSAS was 0·95; alphas for the subscales ranged from 0·82 to 0·91. Among non-anxious control participants, alphas for the Total Score were similarly high (LSAS-CA, 0·92; LSAS-SR, 0·94), and the alphas for the subscales ranged from 0·71 to 0·91.

Means and standard deviations for LSAS Total and subscale scores

Using paired-sample *t* tests, LSAS-SR subscales and Total Scores were compared to their LSAS-CA counterparts. No significant differences were found for individuals with social anxiety disorder. A similar set of analyses was conducted for non-anxious control participants, which also revealed no significant differences between LSAS-CA and LSAS-SR scales. Means, stan-

Table 3. *Coefficient alpha for all subscales of the clinician-administered Liebowitz Social Anxiety Scale (LSAS-CA) and the self-report Liebowitz Social Anxiety Scale (LSAS-SR)*

	Patients ($N = 99$)		Non-anxious controls ($N = 53$)	
Subscale	LSAS-CA	LSAS-SR	LSAS-CA	LSAS-SR
Fear of Performance	0·84	0·82	0·79	0·84
Avoidance of Performance	0·84	0·83	0·71	0·73
Fear of Social Interaction	0·87	0·84	0·81	0·84
Avoidance of Social Interaction	0·84	0·84	0·80	0·78
Total Fear	0·91	0·90	0·88	0·91
Total Avoidance	0·90	0·90	0·84	0·85
Total Score	0·95	0·95	0·92	0·94

Table 4. *Means* (*and standard deviations*) *for the clinician-administered Liebowitz Social Anxiety Scale* (*LSAS-CA*) *and the self-report Liebowitz Social Anxiety Scale* (*LSAS-SR*) *and results of* t *tests comparing the two versions within each subscale*

	Patients ($N = 99$)			Non-anxious controls ($N = 53$)		
Subscale	LSAS-CA	LSAS-SR	$t(98)$	LSAS-CA	LSAS-SR	$t(52)$
Fear of Performance	18·70 (6·31)	19·24 (6·07)	−1·48	3·83 (3·27)	4·20 (4·10)	−0·84
Avoidance of Performance	16·67 (6·61)	17·11 (6·89)	−1·25	3·57 (3·25)	3·14 (3·32)	1·42
Fear of Social Interaction	19·54 (6·31)	19·47 (5·88)	0·17	3·08 (2·97)	3·29 (3·43)	−0·74
Avoidance of Social Interaction	18·49 (6·46)	18·65 (6·65)	−0·52	3·14 (3·45)	2·86 (3·39)	0·96
Total Fear	38·23 (11·62)	38·72 (11·29)	−0·74	6·92 (5·82)	7·49 (7·21)	−0·85
Total Avoidance	35·17 (12·22)	35·90 (12·66)	−1·01	6·71 (5·97)	6·00 (6·16)	1·50
Total Score	73·37 (23·23)	74·53 (23·31)	−0·96	13·61 (11·10)	13·49 (12·70)	0·13

No pairwise comparisons are significantly different.

Table 5. *Zero-order correlations among clinician-administered* (*CA*) *Liebowitz Social Anxiety Scale and self-report* (*SR*) *Liebowitz Social Anxiety Scale scores*

	Fear of Performance	Avoidance of Performance	Fear of Social Interaction	Avoidance of Social Interaction	Total Fear	Total Avoidance	Total Score
Patients ($N = 99$)							
Fear of Performance	**0·83**	0·90	0·79	0·69	0·95	0·85	0·92
Avoidance of Performance	0·89	**0·81**	0·75	0·75	0·87	0·94	0·93
Fear of Social Interaction	0·70	0·71	**0·84**	0·89	0·94	0·87	0·93
Avoidance of Social Interaction	0·65	0·75	0·91	**0·83**	0·83	0·93	0·91
Total Fear	0·92	0·87	0·92	0·85	**0·84**	0·91	0·98
Total Avoidance	0·83	0·94	0·87	0·93	0·92	**0·84**	0·98
Total Score	0·89	0·92	0·91	0·91	0·98	0·98	**0·85**
Non-anxious controls ($N = 53$)							
Fear of Performance	**0·69**	0·83	0·80	0·62	0·96	0·79	0·92
Avoidance of Performance	0·77	**0·77**	0·61	0·68	0·77	0·91	0·88
Fear of Social Interaction	0·73	0·51	**0·80**	0·73	0·94	0·74	0·89
Avoidance of Social Interaction	0·56	0·59	0·75	**0·82**	0·71	0·92	0·85
Total Fear	0·94	0·69	0·92	0·70	**0·75**	0·81	0·96
Total Avoidance	0·74	0·89	0·71	0·90	0·78	**0·85**	0·94
Total Score	0·89	0·84	0·86	0·85	0·94	0·95	**0·82**

The bottom triangle presents intercorrelations for LSAS-CA; the top triangle presents intercorrelations for LSAS-SR; numbers on the diagonals are correlations between the same scale as administered in CA and SR format.

dard deviations and t values are displayed in Table 4. For both LSAS measures, patient means and standard deviations were similar to those reported by Heimberg *et al*. (1999*a*) for the LSAS-CA.

Correlations among LSAS subscale scores

The subscale intercorrelations for the LSAS-CA and the LSAS-SR are displayed in Table 5. The two sets of intercorrelations are essentially identical. Among the LSAS-CA subscales, correlations ranged from 0·65 to 0·98 for social anxiety disorder patients and 0·56 to 0·95 among non-anxious controls. Among LSAS-SR subscales, correlations ranged from 0·75 to 0·98 for social anxiety disorder patients and from 0·61 to 0·96 for non-anxious controls. Finally, LSAS subscale and total scores across LSAS-CA and LSAS-SR were highly correlated with coefficients ranging from 0·81 to 0·85 among social

Table 6. *Zero-order correlations among clinician-administered Liebowitz Social Anxiety Scale (L-CA) and self-report Liebowitz Social Anxiety Scale (L-SR) and criterion measures of social anxiety and depression*

	SIAS		SPS		FQ-S		BDI		HRSD	
	L-CA	L-SR	L-CA	L-SR	L-CA	L-SR	L-CA	L-SR	L-CA	L-SR
Patients ($N = 98$)										
Fear of Performance	0·55	0·58	0·72	0·66	0·66	0·62	0·34	0·28	0·05	0·13
Avoidance of Performance	0·56	0·56	0·62	0·56	0·64	0·55	0·35	0·25	0·17	0·17
Fear of Social Interaction	0·73	0·77	0·52	0·55	0·45	0·55	0·39	0·36	0·26	0·19
Avoidance of Social Interaction	0·73	0·71	0·49	0·48	0·45	0·47	0·35	0·33	0·27	0·24
Total Fear	0·69	0·72	0·67	0·64	0·64	0·64	0·40	0·34	0·18	0·17
Total Avoidance	0·69	0·68	0·59	0·56	0·60	0·56	0·37	0·31	0·25	0·23
Total Score	0·70	0·71	0·64	0·61	0·64	0·62	0·39	0·33	0·22	0·21
Non-anxious controls ($N = 51$)										
Fear of Performance	0·40	0·62	0·31	0·57	—	—	0·21	0·45	—	—
Avoidance of Performance	0·46	0·63	0·31	0·50	—	—	0·08	0·34	—	—
Fear of Social Interaction	0·66	0·63	0·56	0·58	—	—	0·43	0·42	—	—
Avoidance of Social Interaction	0·62	0·66	0·41	0·47	—	—	0·23	0·29	—	—
Total Fear	0·56	0·66	0·46	0·60	—	—	0·34	0·46	—	—
Total Avoidance	0·61	0·70	0·40	0·53	—	—	0·18	0·35	—	—
Total Score	0·62	0·72	0·46	0·60	—	—	0·27	0·43	—	—

SIAS, Social Interaction Anxiety Scale; SPS, Social Phobia Scale; FQ-S, Fear Questionnaire-Social Phobia subscale; BDI, Beck Depression Inventory; HRSD, 21-Item Hamilton Rating Scale for Depression. Correlations $> 0{\cdot}5$ are significant at $P < 0{\cdot}01$; correlations $> 0{\cdot}35$ are significant at $P < 0{\cdot}05$. Patient $N = 63$ for comparisons involving FQ-S and HRSD.

anxiety disorder patients and from 0·69 to 0·82 among non-anxious controls.

Convergent validity

Convergent validity was tested by examining the correlations of LSAS-CA and LSAS-SR with measures of social anxiety. Table 6 displays zero-order correlations of all LSAS-CA and LSAS-SR subscales and total scores with the SIAS, SPS, and the FQ-S. In general, the LSAS-CA and LSAS-SR scales demonstrated similarly strong correlations with the three social anxiety measures among patients with social anxiety disorder. Tests of dependent correlations conducted to evaluate differences in the magnitude of correlations between the LSAS-CA and LSAS-SR total scores with measures of social anxiety revealed no significant differences between the two versions of the LSAS (see Table 6). Among control participants, the LSAS-SR Total Score was more highly correlated with the SPS than was the LSAS-CA Total Score.

Discriminant validity

The correlations of the LSAS-SR and LSAS-CA with the measures of depression were also examined (see Table 6). The two versions of the LSAS were similarly correlated with the measures of depression in the patient sample. In the non-anxious control sample, LSAS-SR was more highly correlated with the BDI than was LSAS-CA.

Discriminant validity was tested by examining differences in the magnitude of LSAS-CA and LSAS-SR Total Score correlations with measures of social anxiety compared to the magnitude of their correlations with measures of depression. Among patients with social anxiety disorder, all correlations with measures of social anxiety were significantly stronger than correlations with measures of depression. Among non-anxious control participants, the LSAS-CA was more strongly related to the SIAS than to the BDI, but this was not the case for LSAS-SR. The other comparisons demonstrated a trend for the LSAS to be more highly related to social anxiety than to depression but were not significant for either LSAS-CA or LSAS-SR.[3]

DISCUSSION

Results of the current study suggest that the LSAS performs well when used in a self-report format. Comparisons of the self-report version of the LSAS to the traditional clinician-administered version revealed few differences between the two forms.

First, for both social anxiety disorder patients and non-anxious controls, the psychometric characteristics of the two scales were virtually identical. Both forms of the LSAS showed strong internal consistency for both the full scale and subscales.

Secondly, sample means on all subscales and the total score did not differ across the two forms. This lack of difference was seen for both social anxiety disorder patients and non-anxious control participants.

Thirdly, subscales and total scores for self-report and clinician-administered formats were highly correlated with one another. Again, this high degree of overlap was seen for both patients and non-anxious controls.

Fourthly, both forms of the LSAS demonstrated strong convergent validity with self-report measures of social anxiety. Correlations with commonly used measures of social anxiety (e.g. SIAS, SPS) were strong and similar to those reported in other published studies (e.g. Heimberg *et al*. 1999*a*).

Finally, both forms of the LSAS showed strong discriminant validity – particularly among individuals with social anxiety disorder. Correlations with both self-report and clinician-rated measures of depression were significantly lower than correlations with self-report measures of social anxiety. Furthermore, given the strong psychometric findings for both patients and non-anxious controls, these conclusions do not appear to be limited to individuals seeking treatment for social anxiety disorder.

Among non-anxious control participants, the LSAS-SR was more highly correlated than the LSAS-CA with one measure of social anxiety and one measure of depression. One possible reason for this difference is that the two criterion measures were both self-report instruments. In general, a stronger relationship is found between constructs when assessed in the same modality (Blaney & Kutcher, 1991).

Limitations and future directions

The present study culled social anxiety disorder patients and control participants from three US sites and obtained a diverse sample. On the one hand, the findings show that social anxiety disorder is not confined to one racial or ethnic group, an important area for future study. However, the findings also show that the two forms of the LSAS may not be equivalent for African American patients. Given that the assessors for the present study were either White or Latino, it may be that African American patients are less inclined to report social anxiety to an assessor from a different ethnic background and more willing to disclose social anxiety on a self-report measure. More study is needed to understand better which measure more validly represents levels of social anxiety in African American participants and how differences in the ethnicity of examiner and patient may affect LSAS-CA scores. Also, differences in reported levels of social anxiety occurred when the interval between administrations exceeded 60 days. Because the LSAS was designed as a state measure of social anxiety (i.e. it assesses fear and avoidance of situations experienced over the last week), the importance of fluctuations over longer periods of time is not great.

It is reasonable to ask whether the LSAS-SR as administered in this study was actually a 'self-report measure'. Although participants were left to their own devices to complete their responses, a detailed set of instructions was first read to each participant and reiterated as necessary to assure understanding. This procedure may have increased the validity of the measure and reduced its similarity to other self-report formats. We chose to follow this procedure because Cox *et al*. (1998) gave no formal instructions for their version of the LSAS-SR and obtained mixed results. Future studies might examine whether simply printing the detailed instructions on the questionnaire is sufficient.

One question not addressed by the current study is whether the LSAS-SR is as sensitive to treatment effects as the LSAS-CA. Cox *et al*. (1998) reported that a self-report version of the LSAS was less sensitive than other measures to changes following cognitive behaviour therapy. The present study used very systematic instructions for administering the self-report LSAS that were similar to those used by Baldwin *et al*. (1999). The importance of these instructions may be reflected in the greater internal consistency of the LSAS-SR in the present study than was reported by Cox *et al*. (1998). Moreover, Baldwin *et al*. (1999) found their self-report LSAS to demonstrate strong treatment sensitivity. Finally, the results of Kobak *et al*. (1998) suggest that the computerized version of

the LSAS demonstrated adequate sensitivity to change. However, this determination was difficult to make as that study evaluated a medication that did not differ significantly from placebo. Thus, future treatment studies may find that the LSAS-SR is both more reliable and sensitive to the effects of treatment if it is administered with detailed and standardized instructions.

In summary, the self-report LSAS has similarly excellent psychometric properties to that of the clinician-administered LSAS – particularly among patients with social anxiety disorder. Findings from the present study support the use of the self-report LSAS in studies requiring a state measure of social anxiety. The possible benefits of a reliable self-report measure of state social anxiety extend beyond clinical trials. In light of the fact that social anxiety disorder goes undiagnosed in the primary care population (Stein *et al*. 1999), the LSAS-SR may provide an important device to assist primary care physicians in its identification.

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NOTES

[1] Of the two versions of the SIAS that are available, this study used the 20-item version.

[2] Means, standard deviations, and results of omnibus tests and pairwise comparisons can be obtained by contacting the corresponding author.

[3] Results of these analyses can be obtained by contacting the corresponding author.

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