Research Article

SCREENING FOR SOCIAL ANXIETY DISORDER WITH THE SELF-REPORT VERSION OF THE LIEBOWITZ SOCIAL ANXIETY SCALE

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Objective: This study examined whether the self-report version of the Liebowitz Social Anxiety Scale (LSAS-SR) could accurately identify individuals with social anxiety disorder and individuals with the generalized subtype of social anxiety disorder. Furthermore, the study sought to determine the optimal cutoffs for the LSAS-SR for identifying patients with social anxiety disorder and its generalized subtype.

Methods: Two hundred and ninety-one patients with clinician-assessed social anxiety disorder (240 with generalized social anxiety disorder) and 53 control participants who were free from current Axis-1 disorders completed the LSAS-SR.

Results: Receiver Operating Characteristic analyses revealed that the LSAS-SR performed well in identifying participants with social anxiety disorder and generalized social anxiety disorder. Consistent with Mennin et al.'s [2002: J Anxiety Disord 16:661–673] research on the clinician-administered version of the LSAS, cutoffs of 30 and 60 on the LSAS-SR provided the best balance of sensitivity and specificity for classifying participants with social anxiety and generalized social anxiety disorder, respectively.

Conclusions: The LSAS-SR may be an accurate and cost-effective way to identify and subtype patients with social anxiety disorder, which could help increase the percentage of people who receive appropriate treatment for this debilitating disorder. Depression and Anxiety 0:1–5, 2008.   © 2008 Wiley-Liss, Inc.

Key words: *social phobia; receiver operating characteristics (ROC); generalized social anxiety disorder; nongeneralized social anxiety disorder; case finding*

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INTRODUCTION

The clinician-administered Liebowitz Social Anxiety Scale (LSAS[1]) is a well-validated (e.g.,[2]) scale used to assess the dimensional severity of social anxiety disorder symptoms and changes in symptoms of social anxiety disorder over the course of treatment (e.g.,[3–7]). The LSAS is a 24-item scale that measures fear and avoidance of social situations over the past week. It consists of 11 items relating to social interaction and 13 items related to public performance. Each item is rated on two 4-point Likert-type scales by a clinician who may ask questions to clarify the appropriate rating for a specific participant. The first rating is a measure of fear/anxiety and ranges from 0 (none) to 3 (severe). The second rating is a measure of avoidance and ranges from 0 (never) to 3 (usually; 68–100%). A total score is calculated by summing all of the fear and avoidance ratings.

The LSAS has good psychometric properties (e.g.,[2,8]). Furthermore, it can be used to reliably classify individuals with and without social anxiety disorder as well as patients with generalized versus nongeneralized social anxiety disorder.[9] Using Receiver Operating Characteristics (ROC) analyses, Mennin et al.[9] found that a score of 30 on the clinician-administered LSAS provided the best balance of sensitivity (the likelihood of having a positive test result among individuals with a positive diagnosis) and specificity (the likelihood of having a negative test result among individuals without the diagnosis) for differentiating patients with social anxiety disorder from healthy controls. Similarly, a score of 60 provided the best balance of sensitivity and specificity for classifying patients with generalized and nongeneralized social anxiety disorder.[9]

Although the LSAS is a reliable and valid instrument, it is relatively costly because it requires a skilled clinician to administer it. Consequently, a self-report version of the LSAS, the LSAS-SR, was developed, which requires participants to answer LSAS questions in a paper–pencil format.

Research has shown that the psychometric properties of the LSAS-SR are sound.[8,10–12] There is also evidence that the clinician-administered version of the LSAS and LSAS-SR may be equivalent. For example, they are highly correlated, and there are no mean differences between them for patients with social anxiety disorder and nonanxious controls.[8,10] However, although these two measures seem to function similarly, it is unclear whether the LSAS cut scores used to classify participants with social anxiety disorder and the generalized subtype of social anxiety disorder[9] also apply to the LSAS-SR. Thus, our goals were as follows:

(1) To determine the optimal cut score for diagnosing social anxiety disorder using the LSAS-SR in a sample of treatment-seeking patients with social anxiety disorder and nonanxious control participants.

(2) To determine the optimal cut score for diagnosing the generalized subtype of social anxiety disorder using the LSAS-SR in a sample of treatment-seeking patients with social anxiety disorder.

METHODS

PARTICIPANTS

The sample consisted of 291 patients with social anxiety (240 with generalized social anxiety disorder; 51 with nongeneralized social anxiety disorder) and 53 nonanxious controls. Ninety-nine of the patients with social anxiety disorder (92 with generalized social anxiety disorder) sought treatment for social anxiety disorder at one of the three clinics: (1) the Adult Anxiety Clinic of Temple University (Temple, $n = 49$); (2) the Anxiety Disorders Clinic of the New York State Psychiatric Institute (NYSPI, $n = 14$); and (3) the Anxiety and Traumatic Stress Program of the University of California, San Diego (USCD, $n = 36$). The other 192 patients with social anxiety disorder (148 with generalized social anxiety disorder) were part of a treatment study at the Center for Anxiety and Related Disorders at Boston University.

Treatment-seeking participants underwent a Structured Clinical Interview (SCI) and received a primary *Diagnostic and Statistical Manual of Mental Disorders* —IV (DSM-IV[13]) diagnosis of social anxiety disorder. The participants from Temple and Boston University were assessed with the Anxiety Disorders Interview Schedule: Lifetime Version for DSM-IV (ADIS-IV–L[14]) whereas the participants at NYSPI and USCD were assessed with the SCI for DSM-IV (SCID[15]). Inter-rater agreement of diagnoses was not assessed in this study. However, training criteria outlined by Brown et al.[16] were satisfied by all interviewers that conducted the ADIS-IV-L. SCID interviewers received similar training. The ADIS-IV-L[16] and SCID[17] demonstrate good inter-rater reliability using this type of training. Diagnosis of generalized versus nongeneralized social anxiety disorder was made based on the results of the structured diagnostic interview (i.e., either the SCID or ADIS-IV-L) without reference to the patient's score on the LSAS-SR.

The 53 nonanxious control participants were recruited by the anxiety clinics at Temple and UCSD (Temple, $n = 36$; UCSD, $n = 17$). These participants were selected to be demographically similar to the participants with social anxiety who were recruited at these sites. Demographic information about the participants is presented in Table 1. The only significant difference between the groups was that the control group was more likely to be single than the group with social anxiety disorder ($P < .05$). The participants from Temple, NYSPI, and UCSD were also included in the Fresco et al.[8] study, and 175 of the participants from Boston University were also included in the Baker et al.[10] study. The other 17 participants from Boston University were recruited after the Baker et al.[10] article was written. The control group had no current Axis-I psychopathology. Participants with social anxiety disorder and some other comorbid disorder were retained in the sample. The five most common comorbid diagnoses included major depression (17.71%), generalized anxiety disorder (15.63%), dysthymic disorder (10.42%), depressive disorder not otherwise specified (6.25%), and specific phobia (4.69%).

MEASURES

Liebowitz Social Anxiety Scale: Self-Report Version (LSAS-SR) is identical to the clinician-administered version of the LSAS described earlier except that the participant reads the questions and records his or her ratings. The following instructions were read to the participants from Temple, USCD, and NYSPI: (1) this measure

TABLE 1. Demographic characteristics of the participants as a function of diagnosis

	Group			
	Social anxiety disorder (Total) ($n = 291$)	Nongeneralized social anxiety disorder ($n = 51$)	Generalized social anxiety disorder ($n = 240$)	Nonanxious control participants ($n = 53$)
Age	$m = 32.67$ $SD = 10.25$ Range = 18–67	$m = 32.00$ $SD = 8.14$ Range = 19–50	$m = 32.83$ $SD = 10.67$ Range = 18–67	$m = 34.32$ $SD = 10.50$ Range = 19–66
Sex				
Male (%)	56.2	56.9	55.8	51.1
Female (%)	43.8	43.1	44.2	48.9
Race				
Caucasian (%)	76.7	88.4	73.8	69.8
African American (%)	10.7	3.9	12.4	20.8
Hispanic (%)	5.3	3.9	6.2	3.8
Other (%)	7.3	3.9	17.6	5.6
Education				
High school or less (%)	24.9	13.5	27.8	15.1
Some college (%)	13.4	5.8	15.3	22.6
College graduate (%)	42.5	57.7	38.8	37.7
Postgraduate (%)	42.5	23.0	18.1	24.6
Marital status				
Single (%)	50.9	51.0	50.8	69.8
Married (%)	36.4	41.2	35.4	15.1
Separated/divorced/widowed (%)	12.7	7.8	13.8	15.1

assesses the way that social anxiety disorder plays a role in your life across a variety of situations; (2) read each situation carefully and answer two questions about each 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 the 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. The participants from Boston University were given the same instructions in a written, rather than oral, format.[1]

PROCEDURE

Participants in the clinical sample completed the LSAS-SR and clinician-administered version of the LSAS[2] before they received treatment.

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[1]This difference in administration procedures seems unlikely to have affected the results because the mean ($M = 75.95$, $SD = 21.70$) and range (range = 15–131) of scores obtained for the patients with social anxiety disorder from Boston University (in which the oral instructions were not administered) were similar to the mean ($M = 77.84$, $SD = 21.93$) and range (range = 9–136) for the patients with social anxiety disorder from the other three sites.

[2]The results for the clinician-administered version of the LSAS are not reported in this article. However, the scores on the clinician-administered version of the LSAS and LSAS-SR were highly correlated ($r = .94$, $P<.001$). Please contact the corresponding author for more information.

DATA ANALYSIS

ROC analysis[18–20] can be used to determine the ability of a test to discriminate individuals with a characteristic from individuals without the characteristic. ROC analysis is based on logistic regression with a continuous predictor variable and a dichotomous criterion variable. Once the logistic regression equation is estimated, the probability of each value of the predictor and its associated sensitivity and specificity values are derived.[18] ROC analysis allows one to evaluate the relative merits of choosing a cut score so that future screening or assessments can be informed based on the needs of the researcher or clinician. Often, the score that maximizes both sensitivity and specificity is considered the best cutoff value for the scale. However, there are times when maximizing sensitivity or specificity is desirable. Please refer to Mennin et al.[9] for more detailed information about ROC analysis.

In this study, ROC analysis was first conducted on the entire sample using the LSAS-SR scores as the predictor variable and social anxiety disorder status (nonanxious control = 0; social anxiety disorder = 1) as the criterion variable. A second ROC analysis was conducted on the participants with social anxiety disorder to examine whether LSAS-SR scores could be used to reliably identify people with generalized social anxiety disorder. The LSAS-SR total score was the predictor variable, and social anxiety disorder subtype was the criterion variable (nongeneralized = 0; generalized = 1).[3] Following each analysis, we examined whether the AUC was significantly different from chance. Furthermore, we sought to determine the scores that provided the best balance of sensitivity and specificity, maximized sensitivity, and maximized specificity. Finally, for the first ROC analysis we examined whether our cut scores matched the cut

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[3]ROC plots are available from the corresponding author.

scores of 30, 10, and 63, respectively, reported by Mennin et al.[9] for the clinician-administered version of the LSAS. For the second ROC analysis, we compared scores derived from this study to cut scores of 60, 47, and 73 reported by Mennin et al.[9]

RESULTS
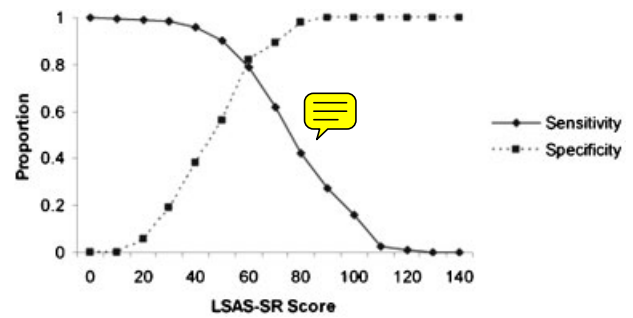
SOCIAL ANXIETY DISORDER VERSUS NONANXIOUS CONTROL PARTICIPANTS

The ROC analysis produced a robust AUC (.98) that was significantly different from the random ROC line ($P<.0001$) for the classification of participants as belonging to social anxiety disorder or nonanxious groups. Consistent with the findings of Mennin et al.[9] an LSAS-SR total score of 30 provided the best balance between sensitivity and specificity and correctly classified 93.90% of the participants (276 out of 291 participants with clinician-assessed social anxiety disorder and 47 out of 53 of the nonanxious participants). See Figure 1.

Mennin et al.[9] found that a cut score of 10 on the clinician-administered version of the LSAS maximized sensitivity. In our sample, this cut score was too low. It correctly identified 99.66% (290 out of 291) participants with social anxiety disorder, but misclassified 62.26% (33 out of 53) nonanxious control participants. In our sample, 14 maximized sensitivity. It correctly classified 99.66% (290 out of 291) participants with social anxiety disorder and misclassified 35.85% (19 out of 53) of the nonanxious control participants.

Mennin et al.[9] found that a cut score of 63 maximized specificity. In this study, a cut score of 63 correctly identified all nonanxious participants (53 out of 53) but misclassified 36.43% of participants (106 out of 291) with clinician-assessed social anxiety disorder. However, in this study, a cut score of 47 maximized specificity—correctly identifying all nonanxious participants (53 out of 53) whereas only misclassifying 15.81% of patients (46 out of 291) with clinician-assessed social anxiety disorder.
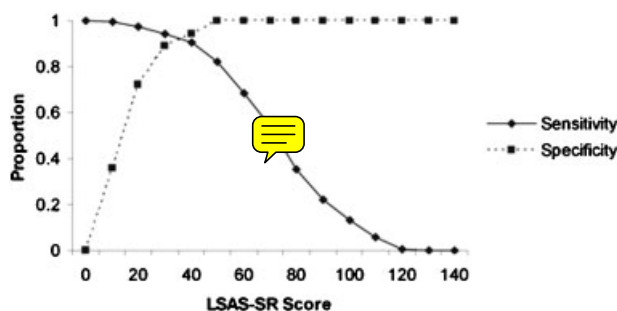
Figure 1. Sensitivity and specificity for classifying participants with social anxiety disorder and nonanxious controls at different values of the LSAS-SR.

Depression and Anxiety

Figure 2. Sensitivity and specificity for classifying generalized and nongeneralized social anxiety disorder at different values of the LSAS-SR.

GENERALIZED SOCIAL ANXIETY DISORDER VERSUS NONGENERALIZED SOCIAL ANXIETY DISORDER

The LSAS-SR scores of patients with generalized and nongeneralized social anxiety disorder were submitted to an ROC analysis. The AUC for this analysis was .86, and was significantly different from chance in determining social anxiety disorder subtype ($P<.0001$). This finding was comparable to previous research using the clinician-administered version of the LSAS (AUC = .82, $P<.001$[9]).

Consistent with Mennin et al.[9] an LSAS-SR cut score of 60 provided the best balance between sensitivity and specificity and a cut score of 47 maximized sensitivity. In our sample, a cut score of 60 correctly classified 81.79% of the participants (198 out of 240 with generalized social anxiety disorder and 40 out of 51 participants with nongeneralized social anxiety disorder). See Figure 2. A cut score of 47 correctly categorized 92.08% of patients (221 out of 240) with generalized social anxiety disorder. However, it misclassified 47.06% of patients (24 out of 51) with nongeneralized social anxiety disorder.

Finally, Mennin et al. reported that a cut score of 73 maximized specificity. In our sample this cut score provided good specificity and correctly classified 88.24% of the participants (45 out of 51) with nongeneralized social anxiety disorder, but it misclassified 43.33% of participants (104 out of 240) with generalized social anxiety disorder. However, a cut score of 76 maximized specificity. This cut score correctly classified 92.16% of the patients (47 of 51) with nongeneralized social anxiety disorder and misclassified 48.75% of the patients (117 out of 240) with generalized social anxiety disorder.[4]

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[4]The ROC analyses were repeated with the participants split into two groups based on which diagnostic interview they had received (i.e., SCID versus ADIS). There were no appreciable differences between the two groups. Thus, diagnostic interview does not appear to affect the results. More information is available from the corresponding author.

DISCUSSION

This study examined the ability of the self-report version of the LSAS to correctly determine presence–absence of social anxiety disorder and of the generalized subtype of social anxiety disorder, as well as deriving the best cut scores for making these determinations. Overall, the results suggest that the LSAS-SR can be used to classify participants with social anxiety from nonanxious controls and participants with generalized social anxiety disorder from participants with the nongeneralized subtype. Furthermore, the results of this study provide cutoffs that are similar to the cutoffs provided by Mennin et al.[9] for the clinician-administered version of the LSAS.

LIMITATIONS AND FUTURE DIRECTIONS

The first limitation in this study is that the nonanxious participants were free from all current mental disorders and this control group may inflate the apparent ability of the LSAS-SR to differentiate between the nonanxious group and people with social anxiety disorder. We decided to include this control group to match the control group in Mennin et al.'s[9] study. However, future research examining whether these results can be replicated using a comparison group that is more representative of the general population could be informative.

A second limitation to this study is that the majority of our sample was Caucasian. Using the same participants that were from Temple NYSPI and USCD in this study, Fresco et al.[8] found that African Americans endorsed greater social anxiety on the LSAS-SR than the clinician-administered version of the LSAS.[8] Caucasians and Latinos, on the other hand, did not score differently on the two versions of this measure.[8] Future research with larger samples is needed to examine measurement invariance of the LSAS-SR across ethnic groups (i.e., do the cut scores reported in this article for a diverse sample apply when ethnicity is considered).

Finally, when looking at the total score, it appears that individuals score equally on the LSAS and the LSAS-SR. However, it would be interesting to conduct future research examining whether this is true at an item level.

In conclusion, although the LSAS is a screening tool and cannot replace clinician assessment, it appears to be a useful tool for classifying nonanxious participants and patients with social anxiety disorder as well as patients with generalized and nongeneralized social anxiety disorder.

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