

Validation of the Social Interaction Anxiety Scale and the Social Phobia Scale Across the Anxiety Disorders

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The psychometric adequacy of the Social Interaction Anxiety Scale (SIAS; R. P. Mattick & J. C. Clark, 1989), a measure of social interaction anxiety, and the Social Phobia Scale (SPS; R. P. Mattick & J. C. Clarke, 1989), a measure of anxiety while being observed by others, was evaluated in anxious patients and normal controls. Social phobia patients scored higher on both scales and were more likely to be identified as having social phobia than other anxious patients (except for agoraphobic patients on the SPS) or controls. Clinician-rated severity of social phobia was moderately related to SIAS and SPS scores. Additional diagnoses of mood or panic disorder did not affect SIAS or SPS scores among social phobia patients, but an additional diagnosis of generalized anxiety disorder was associated with higher SIAS scores. Number of reported feared social interaction situations was more highly correlated with scores on the SIAS, whereas number of reported feared performance situations was more highly correlated with scores on the SPS. These scales appear to be useful in screening, designing individualized treatments, and evaluating the outcomes of treatments for social phobia.

Social phobia was first introduced into the psychiatric nomenclature in the third edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-III; American Psychiatric Association, 1980)* and has since remained a part of the diagnostic lexicon (*DSM-III-R, American Psychiatric Association, 1987; DSM-IV, American Psychiatric Association, 1994*). It is defined in *DSM-IV* (p. 416) as “a marked and persistent fear of one or more social or performance situations in which the person is exposed to unfamiliar people or to possible scrutiny by others. The individual fears that he or she will act in a way (or show anxiety symptoms) that will be humiliating or embarrassing.” Although the diagnosis of social phobia has been established for over a decade, only recently have researchers begun to investigate its assessment and treatment (Heimberg, Liebowitz, Hope, & Schneier, 1995; Stein, 1995). To accurately diagnose social phobia and evaluate treatment efficacy, assessment devices that effectively measure its various elements are needed (Cox & Swinson, 1995; McNeil, Ries, & Turk, 1995).

Although there are several self-report measures of social anxiety,

few have assessed differences in the types of situations feared or avoided. These devices include the Social Phobia subscale of the Fear Questionnaire (Marks & Mathews, 1979), the Social Avoidance and Distress Scale (Watson & Friend, 1969), the Fear of Negative Evaluation Scale (Watson & Friend, 1969), and the Social Phobia and Anxiety Inventory (Turner, Beidel, Dancu, & Stanley, 1989). The limitations of the first three scales in the assessment of social phobia have been discussed elsewhere (Heimberg, Mueller, Holt, Hope, & Liebowitz, 1992). Although the Social Phobia and Anxiety Inventory assesses a broad range of social situations and has substantial data supporting its reliability and validity among patients with social phobia, it does not provide separate scores for different types of anxiety-provoking situations. Assessment of anxiety responses to different classes of situations should have utility for the planning of individualized treatment interventions for patients with social phobia. A set of scales developed by Mattick and Clarke (1989) addresses this concern.

Several investigators have examined the types of situations feared or avoided by patients with social phobia (e.g., Holt, Heimberg, Hope, & Liebowitz, 1992; Turner, Beidel, Dancu, & Keys, 1986). Liebowitz (1987) proposed two broad categories of feared situations: those involving social interactions (e.g., initiating and maintaining conversations) and those in which the person may be observed by others (e.g., formal public speaking, eating or drinking in public). A similar distinction has been discussed by Leary (1983b), who described such interactions as either contingent or noncontingent. In contingent interactions (e.g., conversations), people adjust their own behavior according to their perceptions of the other person. In noncontingent interactions (e.g., formal public speaking), people are less likely to adjust their behavior, possibly because they receive little feedback from their audience. Mattick and Clarke (1989) also conceptualized social anxiety as occurring in two similar types of

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Portions of this article were presented at the annual meeting of the Association for Advancement of Behavior Therapy, Atlanta, Georgia, November 1993. This research was supported by Grants 44119 and 39096 from the National Institute of Mental Health.

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situations: those in which the person interacts with others and those in which the person may be observed or scrutinized by others. The Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1989) assesses *social interactional anxiety*, defined as extreme distress when initiating and maintaining conversations with friends, strangers, or potential mates. The companion Social Phobia Scale (SPS; Mattick & Clarke, 1989) assesses *anxiety when anticipating being observed or actually being observed by other people* and when undertaking certain activities in the presence of others (e.g., public speaking, eating, or writing).

Although the report on the initial development of the SIAS and SPS remains unpublished, these scales increasingly have been used in the evaluation of treatments for social phobia, and each has been shown to be sensitive to the effects of cognitive-behavioral treatments (Mattick & Peters, 1988; Mattick, Peters, & Clarke, 1989; see reviews by Cox & Swinson, 1995, and McNeil et al., 1995; both scales are reprinted in Cox & Swinson, 1995). In the development of the SIAS and SPS, Mattick and Clarke (1989) generated a pool of 164 items from existing inventories and from interviews with social phobic patients. This initial pool was reduced to 75 items with reliably coded relevance to fears of social interaction or scrutiny by others, which were then administered to samples of 243 patients with a *DSM-III* diagnosis of social phobia, 481 college students, 315 community volunteers, and small samples of patients with agoraphobia or simple phobia. Examination of item-total correlations resulted in the deletion of additional items and selection of the final set of 20 scrutiny items (SPS) and 20 social interaction items (SIAS). With this development strategy, the SIAS and SPS may be best considered as subscales of one larger measure.

The SIAS and SPS appear to be psychometrically sound. Mattick and Clarke (1989) reported Cronbach's alphas for each scale for patients with social phobia, college students, community volunteers, agoraphobics, and simple phobics that ranged from .88-.93 for the SIAS and .89-.94 for the SPS. Test-retest correlation coefficients exceeded .90 for both scales after intervals of 1 and 3 months. Similar figures for internal consistency (SIAS = .85-.90; SPS = .87-.93) were reported by Heimberg et al. (1992) in a study of 66 patients with social phobia, 50 community volunteers, and 53 undergraduate students. In that study, 2-week test-retest reliability in the student sample was .86 for the SIAS but only .66 for the SPS.

Concurrent validity of the SIAS and SPS has also been examined among patients with social phobia. Mattick and Clarke (1989) found that both the SIAS and SPS were positively correlated with scores on the Fear of Negative Evaluation Scale, the Social Avoidance and Distress Scale, the Social Phobia subscale of the Fear Questionnaire, and the Interaction Anxiety and Audience Anxiety Scales (Leary, 1983a). Ries et al. (1996) reported that both scales were positively correlated with scores on the Social Phobia and Anxiety Inventory. Heimberg et al. (1992) also addressed convergent and divergent validity, reporting that the SPS was more highly correlated with other measures of performance fear, whereas the SIAS was more highly correlated with other measures of social interactional anxiety. However, these findings may not generalize to patients' reports of distress in specific situations. Correlations between the SIAS and SPS and degree of anxiety reported in actual situations involving

performance or social interaction should be examined to further assess convergent and divergent validity.

Discriminant validity of the two scales has been examined in a number of studies. Patients with social phobia scored higher than undergraduates and community controls on both the SIAS and SPS in the studies by Mattick and Clarke (1989) and Heimberg et al. (1992). Patients who met criteria for the generalized subtype of social phobia reported greater social interactional anxiety (SIAS) than did patients who did not meet these criteria in four studies (E. J. Brown, Heimberg, & Juster, 1995; Heimberg et al., 1992; Holt, Heimberg, & Hope, 1992; Ries et al., 1996), although this difference was evident for the SPS in only one study (E. J. Brown et al., 1995). In Mattick and Clarke (1989), patients with social phobia also achieved higher scores on the SIAS and SPS than did patients with agoraphobia or simple phobia. Rapee, Brown, Antony, and Barlow (1992) also reported that patients with social phobia scored higher on the SIAS than did patients with various other anxiety disorders and a group with no mental disorder. Despite these promising findings, no study has adequately examined scores on both the SIAS and SPS across the range of anxiety disorders. Neither has the impact of social phobia as a secondary diagnosis on the SIAS and SPS scores of patients with other principal anxiety disorders been examined.

In this study, we extended previous research on the SIAS and SPS in a number of ways. We investigated (a) the ability of these measures to discriminate patients with social phobia from other anxiety-disordered patients and to identify patients with social phobia from a mixed anxious sample, (b) the relationship between SIAS and SPS scores and severity of social phobia, (c) the impact of additional diagnoses of anxiety or mood disorders on scale scores among patients with social phobia, and (d) the impact of secondary social phobia among patients with other anxiety disorders. To examine whether the two scales assess fear of different types of situations, we also compared the relationship of SIAS and SPS scale scores to number of social interactional and performance situations feared.

Panic attacks may occur in any of the anxiety disorders, including social phobia. Additionally, social situations are a common sphere of worry in generalized anxiety disorder. Thus, we examined the relationship between the SIAS and SPS and self-report measures of fear of anxiety symptoms and worry to evaluate the relationship between social interactional and observational fears and symptoms of panic disorder and generalized anxiety disorder. We also investigated whether the number of panic symptoms, commonly reported in performance situations, was related to elevated scores on the SPS but not the SIAS.

Method

Participants

The participants were 104 women and 61 men who met *DSM-III-R* criteria for any of the anxiety disorders (other than posttraumatic stress disorder) on the basis of structured interview. Fourteen women and 7 men who were acquaintances (but not relatives) of the patients with anxiety disorders also participated and were paid \$60 for their participation in this and other studies. Anxious participants from each diagnostic group were randomly selected for this study from a larger group of 753 patients with anxiety disorders who had received services

at the Center for Stress and Anxiety Disorders between April 1988 and January 1991. Diagnoses were determined by the Anxiety Disorders Interview Schedule—Revised (ADIS-R; DiNardo & Barlow, 1988). When two or more diagnoses were deemed to be present, the “principal” diagnosis was the one receiving the highest rating of distress and interference with life functioning. Patients’ principal diagnoses were as follows: social phobia ($n = 50$), panic disorder ($n = 29$), panic disorder with agoraphobia ($n = 27$), generalized anxiety disorder ($n = 20$), simple phobia ($n = 19$), and obsessive-compulsive disorder ($n = 20$). Persons in the control group participated in the ADIS-R interview but received no diagnoses of current or past mental disorder.

The proportion of men and women differed across groups, $\chi^2(6, N = 186) = 15.33, p < .02$. A greater percentage of patients with generalized anxiety disorder (60%) and social phobia (50%) were male than was the case in any of the other groups (% male, range = 19–35%). However, gender was unrelated to scores on either the SIAS, $t(184) = -1.51, p > .13$, or the SPS, $t(184) = -0.28, ns$. Age also differed across groups, $F(6, 179) = 4.42, p < .001$. Duncan’s multiple range test ($p < .05$) indicated that patients with generalized anxiety disorder were significantly older ($M = 42.95, SD = 11.79$) than all participants other than patients with simple phobia ($M = 38.89, SD = 12.59$). Patients with simple phobia were significantly older than patients with panic disorder ($M = 32.20, SD = 6.03$) or obsessive-compulsive disorder ($M = 30.90, SD = 6.77$) as well as the participants in the normal group ($M = 31.48, SD = 9.50$), none of whom differed from each other. Patients with social phobia ($M = 35.00, SD = 9.31$) and panic disorder with agoraphobia ($M = 35.11, SD = 10.01$) were intermediate in age, differing only from the patients with generalized anxiety disorder. However, like gender, age was unrelated to scores on the SIAS ($r = .02, ns$) or the SPS ($r = -.10, ns$). Because of their lack of relationship to the SIAS and SPS, age and gender are not considered further in the data analyses.

Measures

ADIS-R. In addition to *DSM-III-R* diagnoses and their respective ratings of severity (range of 0–8), the ADIS-R assesses fear and avoidance in 11 situations often feared by patients with social phobia (rated by the participant on a 0–4 scale: 0 = *no fear or avoidance*, 4 = *very severe fear and avoidance*). These situations were categorized as primarily interactional in nature (e.g., initiating or maintaining a conversation, interacting with an authority figure) or primarily involving performance or observation by others (e.g., formal public speaking). Categorization of situations as interactional versus performance-oriented was accomplished by a panel of nine clinical psychologists and doctoral students experienced in the assessment and treatment of social phobia as part of work previously conducted for the *DSM-IV* task force subworkgroup on social phobia (Schneier et al., in press). Disagreements were rare and were resolved by Richard G. Heimberg. The number of *DSM-III-R* panic attack symptoms experienced in social situations was also tallied. The ADIS-R has been shown to have high rates of interrater reliability for the diagnosis of anxiety disorders (e.g., $k = .79$ for social phobia; DiNardo, Moras, Barlow, Rapee, & Brown, 1993).

Questionnaires. In the larger study conducted at the Center, participants completed questionnaires after the ADIS-R interview. Those examined in this study included the SIAS, SPS, Anxiety Sensitivity Index (Peterson & Reiss, 1987), and Penn State Worry Questionnaire (Meyer, Miller, Metzger, & Borkovec, 1990).

The SIAS consists of 20 items that are rated from 0 (*not at all characteristic or true of me*) to 4 (*extremely characteristic or true of me*). Items are self-statements describing one’s representative reaction to situations that involve social interaction in dyads or groups. The SIAS is scored by summing the ratings (after reversing the 3 positively worded items). Total scores range from 0 to 80, with higher scores representing higher levels of social interaction anxiety.

The SPS also contains 20 items that are rated on a similar 0–4 scale. Items pertain to situations or themes that involve being observed by others (e.g., public speaking, eating or writing in public, etc.). All items are negatively worded. As with the SIAS, scores range from 0 to 80, with higher scores representing greater anxiety about being observed.

The Anxiety Sensitivity Index was used to evaluate the hypothesis that the SPS would correlate more highly than the SIAS with a self-report measure of fear of anxiety. This hypothesis followed from the SPS’s focus on anxiety while being observed by others and the findings of Heimberg, Hope, Dodge, and Becker (1990) and Levin et al. (1993) that heart rate was higher among public-speaking phobics than patients with generalized social phobia during a behavioral test. Perhaps patients with circumscribed fears are more sensitive to anxiety cues because their reactions to performance situations are predictable and unique to these situations in contrast to the ubiquitous anxiety experienced by patients with generalized social phobia. Additionally, patients with discrete observational fears may be more sensitive to physiological cues for fear that these symptoms might become visible to others and lead to negative evaluation.

The Anxiety Sensitivity Index contains 16 items measuring fear of the symptoms of anxiety (e.g., “It scares me when I feel shaky”). Items are rated on a 5-point scale (*very little* to *very much*), and the score is the simple sum of the 16 items (ranging from 0–64). Reliability and validity of the Anxiety Sensitivity Index have been established with anxious patients in a number of studies (e.g., Peterson & Reiss, 1987).

The Penn State Worry Questionnaire was included to assess whether the degree of worry associated with feared social situations is greater for those experiencing anxiety while interacting with others compared with anxiety occurring in performance-oriented situations. Given the overlapping symptomatology of social phobia and generalized anxiety disorder (Rapee, Sanderson, & Barlow, 1988) and the probability that interactional anxiety affects more situations than performance anxiety, a measure of worry (the principal component of generalized anxiety disorder) may correlate more highly with interactional anxiety (SIAS) than observational anxiety (SPS).

The Penn State Worry Questionnaire contains 16 items assessing the specific trait of worry, and it has been used to measure the severity of generalized anxiety disorder (e.g., “I’m always worrying about something”). Items are rated on a 5-point scale (*not at all typical of me* to *very typical of me*). Summed scores range from 16 to 80, with higher scores representing a greater degree of worry. The Penn State Worry Questionnaire has been shown to have adequate internal consistency and convergent and divergent validity with anxious patients (T. A. Brown, Antony, & Barlow, 1992).

Results

Differences Between Social Phobics, Patients with Other Anxiety Disorders, and Normal Controls

The different groups were compared on the SIAS and SPS using one-way analyses of variance (ANOVAs). Significant differences were found for both the SIAS, $F(6, 179) = 13.1, p < .0001$, and SPS, $F(6, 179) = 11.9, p < .0001$. Duncan’s multiple range tests ($p < .05$) revealed that patients with social phobia scored higher on the SIAS than did patients with any other anxiety disorder or normals (Table 1). Patients with panic disorder and agoraphobia (PDA) scored higher than patients with simple phobia, but there were no other differences among anxious patients on the SIAS. Normals achieved lower scores on the SIAS than did all other groups. On the SPS, patients with social phobia scored higher than did all other groups except those with PDA. (This finding is examined further in the section

Table 1
Comparison of Diagnostic Groups on the Social Interaction Anxiety Scale (SIAS) and Social Phobia Scale (SPS)

Scale	Social phobia (<i>n</i> = 50)	PDA (<i>n</i> = 27)	OCD (<i>n</i> = 20)	PD (<i>n</i> = 29)	GAD (<i>n</i> = 20)	Simple phobia (<i>n</i> = 19)	Normal (<i>n</i> = 21)	<i>F</i> (6, 179)	<i>p</i>
SIAS									
<i>M</i>	50.7 _a	40.2 _b	34.6 _{b,c}	33.9 _{b,c}	32.7 _{b,c}	27.1 _c	14.3 _d	13.1	.0001
<i>SD</i>	17.0	16.8	20.1	19.3	16.3	17.0	11.0		
SPS									
<i>M</i>	36.9 _a	33.6 _{a,b}	26.8 _{b,c}	23.9 _{c,d}	18.0 _{c,d}	14.7 _{d,e}	6.3 _e	11.9	.0001
<i>SD</i>	17.5	20.6	21.8	14.8	12.6	14.3	4.9		

Note. PDA = panic disorder with agoraphobia; OCD = obsessive-compulsive disorder; PD = panic disorder without agoraphobia; GAD = generalized anxiety disorder. Group means with different subscripts are significantly different at $p < .05$ (Duncan's multiple range test).

The Effect of Comorbid Diagnoses.) Patients with PDA, in turn, scored higher than patients with panic disorder without agoraphobia, patients with generalized anxiety disorder, patients with simple phobia, and normals. Patients with obsessive-compulsive disorder also achieved higher scores than patients with simple phobia and normals. Normals scored lower on the SPS than did all other groups except patients with simple phobia. In a comparison between patients with and without a secondary diagnosis of social phobia (in addition to a principal diagnosis of another anxiety disorder), patients with a secondary diagnosis of social phobia scored higher on the SIAS, $t(113) = 5.44$, $p < .0001$, and SPS, $t(113) = 4.98$, $p < .0001$, than did those without a secondary diagnosis of social phobia.

Classification of Patients as Cases of Social Phobia

In addition to the ANOVAs, a "caseness" strategy was used in which a person was identified as having social phobia if he or she scored one standard deviation above the mean of Heimberg et al.'s (1992) community sample on the SIAS (≥ 34) or SPS (≥ 24). The percentages of each of the anxiety disorder groups (without an additional diagnosis of social phobia) and the normal control group identified by the two measures (separately and jointly) as cases of social phobia are presented in Table 2. The percentage of patients with a principal diagnosis of social phobia identified as cases was significantly higher than the percentage of each of the other groups for both the SIAS and SPS. *Sensitivity*, or the percentage of actual cases of social phobia correctly identified [true positives/(true positives + false negatives) $\times 100$], was 86% for the SIAS and 76% for the SPS. *Specificity*, or the number of patients without social phobia correctly identified [true negatives/(false positives + true negatives) $\times 100$], was 70% for the SIAS and 72% for the SPS. The overall efficiency of the test (i.e., hit rate) was 75% for the SIAS and 73% for the SPS. When a criterion score on both scales was required for classification as a case, the pattern was similar but more conservative. A slightly smaller percentage (72%) of patients with social phobia were correctly identified. However, a larger percentage (80%) of patients without social phobia were correctly classified as noncases. The overall hit rate increased to 77%. (These analyses were repeated, including

patients with a principal diagnosis of an anxiety disorder other than social phobia but with an additional diagnosis of social phobia. These patients were classified as positive for social phobia in the reanalyses. The results were equivalent.)¹

The Effects of Comorbid Diagnoses

SIAS and SPS scores of subgroups of patients with social phobia with and without additional diagnoses were compared using independent sample *t* tests. The additional diagnoses that were examined included mood disorders (major depressive disorder, dysthymia, or depressive disorder not otherwise specified), generalized anxiety disorder, and panic disorder. No differences were found between patients with social phobia with and without additional diagnoses of mood disorder or panic disorder (with or without agoraphobia) on either the SIAS and SPS or generalized anxiety disorder on the SPS. The mean SIAS score for patients with social phobia with generalized anxiety disorder ($M = 60.1$, $SD = 12.5$) was higher than the score for patients with social phobia without generalized anxiety disorder ($M = 48.9$, $SD = 17.2$), $t(48) = 2.18$, $p < .05$.

¹ In addition to the caseness analyses, we also examined the classification of patients by using discriminant function analysis (DFA), as suggested by an anonymous reviewer. Several DFAs were conducted, but we present only the analysis examining the classification of patients into groups using both the SIAS and SPS as predictors of group membership, the analysis that resulted in the highest correct classification rate. Results of other DFAs are available from Richard G. Heimberg. Patients with secondary diagnoses of social phobia were not included in these analyses, which attempted to classify patients into one of three groups: (a) patients with a principal diagnosis of social phobia, (b) patients with a principal diagnosis of another anxiety disorder other than simple phobia, and (c) patients with simple phobia and normal controls. Two discriminant functions were calculated, with a resultant $\chi^2(4, N = 154) = 76.25$, $p < .0001$. The first function accounted for nearly 99% of the variance. The SIAS and SPS contributed approximately equally to the prediction of group membership, and the overall correct classification rate (hit rate) was 61%. Prior probability of correct classification into the three groups based only on sample size was 32%, 41%, and 26%, respectively. The use of the SIAS and SPS increased these figures to 70%, 64%, and 45%.

Table 2
Percentage of Each Diagnostic Group Classified as Cases Using the Social Interaction Anxiety Scale (SIAS) and Social Phobia Scale (SPS)

Scale	Social phobia (<i>n</i> = 50)	PDA (<i>n</i> = 16)	OCD (<i>n</i> = 13)	PD (<i>n</i> = 20)	GAD (<i>n</i> = 15)	Simple phobia (<i>n</i> = 19)	Normal (<i>n</i> = 21)
SIAS	86% _a	50% _b	23% _{c,d,e}	35% _{b,c,d}	20% _{d,e}	42% _{b,c}	10% _e
SPS	76% _a	50% _b	38% _{b,c}	45% _b	20% _c	21% _c	0% _d
SIAS and SPS	72% _a	44% _b	23% _{b,c}	35% _b	7% _{c,d}	16% _c	0% _d

Note. PDA = panic disorder with agoraphobia; OCD = obsessive-compulsive disorder; PD = panic disorder without agoraphobia; GAD = generalized anxiety disorder. A case is defined as a participant who scored 1 *SD* above the mean of the Heimberg et al. (1992) community sample (SIAS \geq 34; SPS \geq 24). Percentages with different subscripts are significantly different at $p < .05$ (test for significance of difference between two proportions). Participants with an additional diagnosis of social phobia were excluded from this analysis.

Because patients with PDA were not distinguished from those with social phobia on the SPS in the ANOVA of anxiety disorder groups, we further examined the scores of patients with PDA on the SPS. Patients with a principal diagnosis of panic disorder and agoraphobia but no additional diagnosis of social phobia and patients with a principal diagnosis of panic disorder and agoraphobia and an additional diagnosis of social phobia were compared on the SPS (and the SIAS). The mean SPS score for patients with panic disorder, agoraphobia, and social phobia ($M = 43.9$, $SD = 18.5$) was substantially higher than the score for patients with panic disorder and agoraphobia but no additional diagnosis of social phobia ($M = 26.5$, $SD = 19.4$), $t(25) = 2.33$, $p < .03$. Similarly, patients with panic disorder, agoraphobia, and social phobia scored substantially higher ($M = 48.2$, $SD = 19.5$) than did patients with panic disorder and agoraphobia but no additional diagnosis of social phobia on the SIAS ($M = 34.7$, $SD = 12.4$), $t(25) = 2.21$, $p < .04$.

Correlational Analyses

The SIAS and SPS were correlated with the Anxiety Sensitivity Index, Penn State Worry Questionnaire, and each other (see Table 3). *T* tests for the significance of differences between dependent correlations revealed that the SPS correlated more highly with the Anxiety Sensitivity Index than did the SIAS. No significant differences were found for the Penn State Worry Questionnaire.

Three measures taken from the social phobia section of the ADIS-R (Clinician Severity Rating for patients who had a

principal or additional diagnosis of social phobia, number of feared social situations, and number of panic symptoms endorsed during social situations) were also correlated with scores on the SIAS and SPS. The correlation between the SIAS and the Clinician Severity Rating was .50 ($p < .001$), and the correlation between the SPS and the Clinician Severity Rating was .40 ($p < .01$). The SIAS and SPS were also correlated with the number of interactional situations and performance situations receiving an anxiety rating of 2 or more on the 0–4 scale (Table 4). *T* tests for the significance of differences between dependent correlations revealed that the number of interactional situations endorsed correlated more highly with the SIAS than the SPS, whereas the number of performance situations endorsed was more highly correlated with the SPS than the SIAS. Similarly, the SIAS correlated more highly with number of interactional situations than with number of performance situations, whereas the SPS correlated more highly with the number of performance situations than the number of interactional situations. Neither the SIAS nor SPS correlated significantly with the number of panic symptoms endorsed during social situations.

Discussion

The SIAS and SPS appear to be promising measures of social phobia. These measures reliably discriminated patients with social phobia from patients with other anxiety disorders and persons with no mental disorder. Scores on the SIAS were higher for patients with social phobia than for all other groups. Similar

Table 3
Correlations Between Measures of Anxiety Sensitivity and Worry and the Social Interaction Anxiety Scale (SIAS) and Social Phobia Scale (SPS)

Scale	SIAS	SPS	<i>t</i> (181)	<i>p</i>
SPS	.72	—		
Anxiety Sensitivity Index	.41	.55	3.05	.005
Penn State Worry Questionnaire	.43	.45	0.47	<i>ns</i>

Note. *N* = 184. All correlations were significant ($p < .001$).

Table 4
Correlations Between Number of Feared Social Situations (per the ADIS-R) and the Social Interaction Anxiety Scale (SIAS) and Social Phobia Scale (SPS)

Situation	SIAS	SPS	<i>t</i> (70)	<i>p</i>
Social interaction	.53**	.18	3.49	.005
Performance	.28*	.53**	2.49	.01

Note. *N* = 73. ADIS-R = Anxiety Disorders Interview Schedule—Revised.

* $p < .01$. ** $p < .001$.

findings were obtained for the SPS, although patients with social phobia could not be distinguished from those with panic disorder and agoraphobia. Scores on these two self-report scales were also correlated with a clinician-administered index of the severity of social phobia. Although the magnitude of these correlations may be best described as moderate, they were observed despite the differences in methodology between questionnaire and interview assessments.

The finding that patients with social phobia and those with panic disorder and agoraphobia were not distinguishable on the SPS suggests that the SPS may be less sensitive to the difference between these groups than is desirable. However, comparisons of SIAS and SPS scores between the 11 patients with panic disorder and agoraphobia who had an additional diagnosis of social phobia and the 16 patients with panic disorder and agoraphobia but no additional diagnosis of social phobia revealed that patients with social phobia scored higher on both scales than did those patients without social phobia. Thus, the failure of the SPS to separate patients with social phobia from patients with panic disorder and agoraphobia may be a result of the social anxieties of a substantial proportion of the PDA group (41%). In fact, patients with PDA without an additional diagnosis of social phobia were not as likely as those with social phobia to be selected as cases using only the SPS.

The results of the caseness analyses further demonstrate the sensitivity and specificity of both scales to social phobia. Note that these analyses may be conservative because less than one third ($n = 50$) of the relevant sample ($N = 154$) had a principal diagnosis of social phobia, patients with a secondary diagnosis of social phobia were excluded, and the overall hit rate should be expected to drop as the base rate declines.² Of the patients with a principal diagnosis of social phobia, 86% scored a standard deviation or more above the mean of the Heimberg et al. (1992) community sample on the SIAS, and 76% did so on the SPS. The percentages of patients correctly classified as cases by the SIAS and SPS were substantially higher than percentages of patients in all other diagnostic groups misclassified by these measures. The conjoint use of both scales correctly classified a slightly smaller percentage of patients with social phobia, but it was less likely to misclassify other patients as social phobic, resulting in an overall higher hit rate and suggesting that the SIAS and SPS have incremental validity in the assessment of social phobia.

We examined the ability of the SIAS and SPS to correctly classify anxiety disorder patients and normal controls using discriminant function analysis (DFA) as well as the caseness approach. The DFA improved classification substantially beyond base rates in the sample but produced a slightly less effective classification than the caseness approach. Because (a) the caseness approach is much easier for clinicians to apply, (b) the hit rate using both scales was 16% higher than the best outcome with the DFA (77% vs. 61%), and (c) it has now been demonstrated to separate social phobics from other anxiety patients and normals in two separate samples (the present one and the one utilized by Heimberg et al., 1992), we believe the caseness approach to have substantial clinical utility. Although not adequate for purposes of diagnosis, an overall hit rate of 77% may be quite appropriate for use as a screening measure or as a cue for more in-depth assessment.

Analyses comparing patients with social phobia with and without additional diagnoses produced evidence of the specificity of the SIAS and SPS to social phobia, but that evidence was somewhat mixed. In support, there were no differences between patients with social phobia with and without an additional diagnosis of mood disorder or panic disorder on either the SIAS or SPS, nor was there a difference between patients with social phobia with and without generalized anxiety disorder on the SPS. However, patients with social phobia and generalized anxiety disorder scored higher on the SIAS than did those with social phobia without generalized anxiety disorder. The latter finding is consistent with the high endorsement of social anxiety symptoms among patients with generalized anxiety disorder (Rapee et al., 1988) and the frequent assignment of social phobia as an additional diagnosis to these patients (T. A. Brown & Barlow, 1992). Scores on the SIAS may be the result of patients' social phobia rather than their general anxiety, but it is unlikely that the SIAS can discriminate sufficiently well between the fears of the person with social phobia and the worries of the patient with generalized anxiety disorder about interactions with others.

To further evaluate the SIAS and SPS, the influence of panic symptomatology was investigated. The number of panic symptoms endorsed during feared social situations was not related to SIAS and SPS scores. The SPS did correlate more highly than the SIAS with scores on the Anxiety Sensitivity Index, a measure of fear of anxiety and panic symptoms. This finding extends Heimberg et al.'s (1990) and Levin et al.'s (1993) report of the relationship between fears in a specific performance situation (i.e., public speaking) and increased heart rate, suggesting a possible relation between panic symptomatology and fear of performance in specific situations involving observation by others. Further investigation of this hypothesis is warranted.

The SIAS and SPS appear to measure different yet related constructs. The measures correlated with one another and with the Anxiety Sensitivity Index, the Penn State Worry Questionnaire, and interviewer-rated severity of social phobia. Nevertheless, the number of interactional situations rated as moderately, severely, or very severely feared correlated more highly with the SIAS, whereas the number of performance situations so rated correlated more highly with the SPS. Although both are highly relevant to social phobia, these differences support Mattick and Clarke's (1989) distinction between social interactional anxiety and scrutiny fears.

Although questions remain about the relation of panic symptomatology and generalized anxiety disorder to SIAS and SPS scores among patients with social phobia, this study provides further evidence of the psychometric adequacy of these two scales and extends previous research on their validity (Heimberg et al., 1992; Mattick & Clarke, 1989; Rapee et al., 1992). The ability of these scales to distinguish among anxiety disorder diagnoses and correctly classify patients with social phobia exemplifies their utility as tools for the assessment of social phobia.

² We thank associate editor Stephen N. Haynes for pointing this out to us.

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Received February 6, 1996

Revision received August 8, 1996

Accepted August 15, 1996 ■