

Winter 1992

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Heimberg, Richard G.; Mueller, Gregory P.; Holt, Craig S.; Hope, Debra A.; and Liebowitz, Michael R., "Assessment of Anxiety in Social Interaction and Being Observed by Others: The Social Interaction Anxiety Scale and the Social Phobia Scale" (1992). *Faculty Publications, Department of Psychology*. 918.

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Published in *Behavior Therapy* 23:1 (Winter 1992), pp. 53–73; doi: 10.1016/S0005-7894(05)80308-9
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Submitted April 26, 1991; accepted October 10, 1991.

Assessment of Anxiety in Social Interaction and Being Observed by Others: The Social Interaction Anxiety Scale and the Social Phobia Scale

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Abstract

Social phobia has become a focus of increased research since its inclusion in DSM-III. However, assessment of social phobia has remained an underdeveloped area, especially self-report assessment. Clinical researchers have relied on measures that were developed on college populations, and these measures may not provide sufficient coverage of the range of situations feared by social phobic individuals. There is a need for additional instruments that consider differences in the types of situations (social interaction vs. situations involving observation by others) that may be feared by social phobics and between subgroups of social phobic patients. This study provides validation data on two instruments developed by Mattick and Clarke (1989): the Social Interaction Anxiety Scale (SIAS), a measure of anxiety in social interactional situations, and the Social Phobia Scale (SPS), a measure

of anxiety in situations involving observation by others. These data support the use of the SIAS and SPS in the assessment of individuals with social phobia.

Social phobia was described in the 1960s by Marks (1969; Marks & Gelder, 1966), but it did not become part of the psychiatric nomenclature until the publication of DSM-III (American Psychiatric Association, 1980). Since that time there has been a steadily increasing interest in the psychopathology and treatment of social phobia (Heimberg, 1989; Turner & Beidel, 1989) and a continuing effort to revise the diagnostic criteria (DSM-III-R; American Psychiatric Association, 1987). However, our knowledge of social phobia has lagged behind our knowledge of other anxiety disorders.

A prerequisite for the continued research on social phobia and its treatment is the ability to properly assess clinically severe social anxiety and changes in social anxiety as a result of treatment. In the realm of self-report assessment, two choices have traditionally been available. First, the Fear Questionnaire (Marks & Mathews, 1979) contains a Social Phobia subscale that specifically measures avoidance of social situations and has been widely used as a means of assessing the effects of behavioral treatments in clinical outcome studies. However, the Fear Questionnaire subscale contains only 5 items and fails to assess the broad range of situations that may be feared by individuals with social phobia. Second, a number of researchers have utilized scales measuring social or performance anxiety that have been developed or validated on a college student population. These scales include the Social Avoidance and Distress Scale and the Fear of Negative Evaluation Scale (Watson & Friend, 1969) and the Personal Report of Confidence as a Speaker (Paul, 1966), among others. The use of these scales in the assessment of social phobia has been the subject of debate (Heimberg, Hope, Rapee, & Bruch, 1988; Turner, Mccanna, & Beidel, 1987). Although these measures may, in fact, have clinical utility, it is preferable to utilize measures that have been developed for the specific purpose of assessing the concerns of individuals with social phobia and for which normative and validation data with social phobics have been reported.¹

Another important issue in the assessment of social phobia concerns the types of situations that may be feared or avoided by social phobics. Social phobics may report significant anxiety in diverse situations including public speaking, informal social interaction, assertive behavior, and eating, drinking, or performing in the presence of others (Holt, Heimberg, Hope, & Liebowitz, in press-b). These situations have typically been separated into two general categories, namely situations involving social interactions with others and situations in which the individual may be observed by others (Liebowitz, 1987). Leary (1983) has made a similar distinction between *contingent* and *noncontingent* interactions. In contingent interactions (e.g., conversations), the person must continuously monitor the behavior of the other person and adjust his/her behavior accordingly. In noncontingent interactions (e.g., public speaking), there may be less need to adjust to the behavior of others, but there is little feedback about how others evaluate the person. These types of interactions require quite different skills on the part of the individual, and any social phobic may fear one, the other, or both types of interactions. No instrument discussed above gives sufficient attention to these distinctions in the assessment of social phobia.

Mattick and Clarke (1989) have developed a set of companion scales to assess social phobia which address the issues noted above: the Social Interaction Anxiety Scale (SIAS), which assesses anxiety in social situations, and the Social Phobia Scale (SPS), which assesses anxiety in situations in which the individual may be observed by others. The SIAS and SPS have shown to be sensitive to the effects of cognitive and behavioral treatments in clinical outcome studies (Mattick & Peters, 1988; Mattick, Peters, & Clarke, 1989). However, the primary data on the SIAS and SPS (Mattick & Clarke, 1989) remain unpublished at the current time. Therefore, we provide a brief summary of their psychometric development.

A pool of 164 items was generated from existing anxiety inventories and from clinical interviews with social phobic patients and reduced to a core set of 79 items based on their relevance to fears of social interaction or scrutiny by others. Four additional items were deleted because a panel of judges could not agree on whether they assessed social interactional or observational fears. The remaining items (38 interactional, 37 observational) were administered to samples of 243 DSM-III-diagnosed social phobics, 481 college students, 315 community volunteers, and smaller samples of agoraphobics and simple phobics. Examination of item-total correlations resulted in the deletion of additional items and the selection of the final set of 20 observational (SPS) and 20 social interactional (SIAS) items.

Mattick and Clarke (1989) report Cronbach's alphas from the five samples mentioned above ranging from 0.89 to 0.94 for the SPS and 0.88 to 0.93 for the SIAS. Test-retest correlations in small samples of untreated DSM-III social phobics exceeded 0.90 at intervals of up to 13 weeks. Furthermore, social phobics achieved higher scores on each scale than either the combined normal groups or the sample of agoraphobics. Neither scale was related to a measure of social desirability. However, significant correlations were recorded between the SPS, SIAS, and several measures of social interactional or performance anxiety. Mattick and Clarke (1989) did not report on the relative strength of the relationships between the SPS and SIAS and these other measures, i.e., whether the SIAS was more strongly related to measures of social interactional anxiety and the SPS more strongly related to measures of performance anxiety.

In addition to the assessment of situations feared by social phobics, an important aspect of the diagnosis and assessment of social phobia is the specification of *subtype* of social phobia. In DSM-III-R, patients are designated as having the generalized subtype of social phobia if their fear is evident in most social situations. Although the specifics of diagnostic subtyping are an issue of debate in the development of DSM-IV (Heimberg, Holt, Schneier, Spitzer, & Liebowitz, 1991), it has become clear that some subtyping distinctions have clinical utility. For instance, Heimberg, Hope, Dodge, and Becker (1990) compared generalized social phobics to social phobic patients who presented with specific fears of public speaking and found them to be younger, less likely to be employed and more functionally impaired by their social phobias. Generalized social phobics appear more likely to receive a comorbid diagnosis of avoidant personality disorder than other social phobics, although the degree of overlap between these diagnoses is unclear (Holt, Heimberg, & Hope, in press-a; Schneier, Spitzer, Gibbon, Fyer, & Liebowitz, in press). The generalized subtype was more frequently diagnosed among a group of social phobics with a previous history of alcoholism (Schneier, Martin, Liebowitz, Gorman, & Fyer, 1989). Generalized social phobics may fare less well in cognitive-behavioral group therapy than other social phobics

(Heimberg, 1986), and the subtypes may also respond differently to pharmacologic intervention (Levin, Schneier, & Liebowitz, 1989).

In DSM-III, patients with specific fears of being observed by others received a diagnosis of social phobia, and patients with broadly generalized fears of social interaction received a diagnosis of avoidant personality disorder. In DSM-III-R, however, both groups of patients receive a diagnosis of social phobia, and patients whose fears are evident in most social situations are additionally designated as having the generalized subtype of social phobia (and may also receive a diagnosis of avoidant personality disorder). DSM-III-R's distinction between generalized social phobias and other ("nongeneralized") social phobias is only roughly related to the distinctions noted above between social interaction situations and performance/observation situations or between contingent and noncontingent interactions since it is defined in terms of range rather than type of situations feared. However, nongeneralized social phobics might be expected to achieve more elevated scores on the SPS than the SIAS, although generalized social phobics might be expected to achieve high scores on both instruments.

The present study attempted to provide further data on the SIAS and SPS with a sample of social phobics diagnosed according to DSM-III-R rather than DSM-III criteria. We examined: (a) social phobics' responses to the SIAS and SPS in comparison to those of a matched sample of community volunteers, (b) the potentially different responses of social phobic subtypes to the SIAS and/or the SPS, (c) the relationship of social phobics' SIAS and SPS scores to other self-report and clinician-administered measures of fear in situations involving social interaction or observation by others, (d) the notion that SIAS responses would be more closely associated with other measures of social interactional anxiety and their SPS scores would be more closely related to fears of performance or of being observed by others, and (e) the temporal stability of the SIAS and SPS in a sample of college students. We also examined differences in response to the SIAS and SPS between the social phobics in our sample and in the sample reported by Mattick and Clarke (1989).

Method

Subjects

Social phobics

Two clinical samples were comprised of outpatients at the Center for Stress and Anxiety Disorders, University at Albany, State University of New York (CSAD) ($n = 40$) and the New York State Psychiatric Institute (NYSPI) ($n = 26$). Subjects were assessed at CSAD with the Anxiety Disorders Interview Schedule–Revised (ADIS-R; DiNardo & Barlow, 1988) and at NYSPI with the Schedule for Affective Disorders and Schizophrenia–Lifetime Version for the Anxiety Disorders (SADS-LA; Fyer, Endicott, Mannuzza, & Klein, 1985). All subjects met DSM-III-R criteria for social phobia as determined by their responses to either of these structured interviews. At each site, the diagnosis was confirmed by the use of the social phobia section of the other site's instrument. Both structured interviews have a distinguished history in the diagnosis of anxiety disorders and have been characterized by

high rates of interrater agreement for the diagnosis of social phobia (ADIS-R Kappa = 0.87; Barlow & DiNardo, 1991; SADS-LA Kappa = 0.68, Mannuzza et al., 1989).

Subjects were also classified into subtypes of social phobia according to DSM-III-R. The subtype of generalized social phobia was assigned if the subject feared most or all social situations. Subjects were classified as "nongeneralized" if they feared a number of social or observational situations but there was some area of social functioning in which they were unimpaired. Subtype diagnosis was originally given by the preliminary interviewer, presented to each site's senior clinician, and discrepancies in judgment were resolved by discussion.

To determine the reliability of subtype diagnosis, the lists of specific situations contained in the ADIS-R and the SADS-LA were reviewed by clinicians blind to the original subtype diagnosis. A subject was classified as generalized if he/she reported significant fear across a broad range of these situations and classified as nongeneralized if there were significant situations (other than those focusing solely on observation by others) that were not highly rated. An additional category of discrete social phobia was reserved for subjects who reported only limited specific fears. However, this classification was not applied to any subject in the current sample. Of 20 cases reviewed in this manner, clinicians agreed with the original subtype diagnosis on 17 (85%; Kappa = .70).

Nineteen subjects from CSAD and all subjects from NYSPI were participants in a controlled comparison of phenelzine and cognitive behavioral group therapy (CBGT) for social phobia conducted collaboratively at the two sites. The remaining 21 subjects from CSAD refused randomization or failed to receive medical clearance for administration of phenelzine and participated in an additional study of CBGT. Subjects from each site were similar to those reported in previous studies of the treatment of social phobia (Heimberg, Dodge, Hope, Kennedy, Zollo, & Becker, 1990; Liebowitz et al., 1988). Potential subjects were excluded from either treatment study if they received a comorbid diagnosis of current major depression, bipolar disorder, psychotic disorder, or active alcohol or drug dependence within the past three months. Interviewers also rated each patient on the 0-to-8 Clinician's Severity Rating which is included in the ADIS-R. Patients were to be included in the present study only if this rating equaled or exceeded 4 (moderate impairment in daily functioning). However, no subject was excluded on this basis. No significant differences were found between CSAD and NYSPI social phobics on any demographic characteristic (age, gender, marital status, employment, income, and education). Demographic characteristics of the pooled social phobic sample are presented in Table 1.

Community comparison group

A group of community volunteers was included in the study to provide a background against which to evaluate the SIAS and SPS scores of social phobics. Since Mattick and Clarke (1989) also implied that the SIAS and SPS might be useful in assessing social interactional and observational fears in nonclinical populations, the relationship of these scales to other measures of social anxiety was also examined in the community comparison group. This group ($n = 50$) was comprised of individuals recruited from the Albany community who responded to bulletin board advertisements requesting the assistance of persons who were neither anxious nor depressed. Although no formal diagnostic evaluation

was conducted, each potential community subject participated in a detailed telephone screening interview to rule out anxiety disorder, affective disorder, or substance abuse (or treatment of same) within the past two years.² Community subjects were admitted into the study in the order they passed screening with the constraints that the total sample contain equal numbers of males and females and be equated with the social phobics on age. These individuals received \$30 for their participation. Community subjects did not differ significantly from social phobics on any demographic characteristic. Demographic characteristics of the community subjects are also reported in Table 1.

Table 1. Demographic Characteristics of Social Phobics and Community Subjects

	Social Phobics	Community Subjects
Women/men	26/40	25/25
Mean age	36.5 (S.D. = 11.3)	33.2 (S.D. = 9.4)
Marital status		
Single	42 (63.6%)	18 (36.0%)
Married/ cohabitating	17 (25.8%)	24 (42.0%)
Divorced/separated	7 (10.6%)	8 (16.0%)
Education		
High school graduate	7 (10.6%)	14 (28.0%)
Some college	14 (21.2%)	15 (30.0%)
College graduate	19 (28.8%)	12 (24.0%)
Graduate school	25 (37.9%)	9 (18.0%)
Employment		
Homemaker	2 (3.0%)	1 (2.0%)
Student	12 (18.2%)	2 (4.0%)
Employed full-time	38 (57.6%)	42 (84.0%)
Employed part-time	6 (9.1%)	4 (8.0%)
Unemployed	7 (10.6%)	1 (2.0%)
Retired	1 (1.50%)	0 (0%)

College students

A group of college students ($n = 53$) received credit in their introductory psychology course at the University at Albany, State University of New York, for their participation. College students were included in the study as a convenience sample for the assessment of temporal stability, but the relationship of their SIAS and SAS scores to other measures of social anxiety was also examined. Students were not screened for emotional distress or treatment.

Measures

The *Social Interaction Anxiety Scale* (SIAS) contains 20 items which 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 typical cognitive, affective, or behavioral reaction to a variety of situations requiring social interaction in dyads or groups (e.g., going to a party, talking to an attractive member of the opposite gender, expressing one's feelings). The SIAS is scored by summing the ratings (after reversing the 3 positively-worded items), and total scores range from 0 to 80. Higher scores represent higher levels of social interactional anxiety.

The *Social Phobia Scale* (SPS) also contains 20 items which are given a rating of 0 (not at all characteristic or true of me) to 4 (extremely characteristic or true of me). Here the items pertain to situations or themes which involve being observed by others (e.g., speaking to a group, eating in public, writing in public, using a public rest room). All items are negatively worded. Like the SIAS, scores range from 0 to 80, and higher scores represent greater anxiety about being observed by others.

Other questionnaire measures commonly used in research on social phobia or related anxieties in normal populations were also included in the study, and the SIAS and/or SPS were expected to correlate with several of these measures. In addition, the inclusion of these measures (which assess both social interactional and observational fears) provided an opportunity to examine both the convergent and discriminant properties of the SIAS and SPS. A semistructured interview which assesses fear in both social interactional and performance-oriented situations was also administered to social phobic subjects in order to examine the validity of the SIAS and SPS across different modes of assessment (interview vs. self-report). A brief description of these measures is presented below.

The *Social Avoidance and Distress Scale* (Watson & Friend, 1969) is a 28-item true-false inventory which assesses distress and discomfort in interpersonal interactions and deliberate avoidance of social situations. Sample items include "I often find social occasions upsetting" and "I try to avoid talking to people unless I know them well." It is among the most commonly used measures for the assessment of social anxiety in college students (Heimberg, 1988) and frequently used as an outcome measure in clinical trials of social phobia (Butler, Cullington, Munby, Amies, & Gelder, 1984; Heimberg, Dodge et al., 1990). Watson and Friend (1969) report a one-month test-retest coefficient of 0.68, and Jones, Briggs, and Smith (1986) report Cronbach's alphas of 0.88–0.90 in undergraduate samples. Scores on the Social Avoidance and Distress Scale were significantly related to peer ratings of social skill and observational measures (gaze, speech latency, number of words spoken) derived from two social interaction tasks (Arkowitz, Lichtenstein, McGovern, & Hines, 1975). High scorers preferred to work alone and tended to avoid social interactions (Watson & Friend, 1969), and reported more negative self-statements (Cacioppo, Glass, & Merluzzi, 1979) and fewer positive self-statements (Heimberg, Acerra, & Holstein, 1985) than low scorers in anticipation of an interaction with a person of the opposite sex.

The *Fear of Negative Evaluation Scale* (Watson & Friend, 1969) is a 30-item true-false questionnaire which assesses the fear of receiving negative evaluations from others. Sample items include "I am afraid that I may look ridiculous and make a fool of myself" and "I feel very upset when I commit some social error." Watson and Friend (1969) report a one-month test-retest coefficient of 0.78 in an undergraduate sample. High scorers became more anxious in social-evaluative situations and worked harder to gain approval or avoid disapproval (Watson & Friend, 1969), tended to avoid potentially threatening social comparisons (Friend & Gilbert, 1973), and felt worse about receiving negative evaluations than low scorers (Smith & Sarason, 1975). The Fear of Negative Evaluation Scale is also commonly used in studies of the treatment of social phobia. Changes in fear of negative evaluation have significantly predicted treatment outcome in two studies (Mattick & Peters, 1988; Mattick et al., 1989).

The *Fear Questionnaire* (Marks and Mathews, 1979) is broadly used as an outcome measure in phobia treatment studies (Barlow & Wolfe, 1981), and the factor-analytically derived Social Phobia subscale was included in the present study. This scale consists of five items (e.g., "Eating or drinking with other people," and "Speaking or acting to an audience") which are rated on a scale from 0 (would not avoid it) to 8 (always avoid it). Marks and Mathews (1979) report good test-retest reliability in a clinical sample, and additional psychometric data are reported by Arrindell, Emmelkamp, and van der Ende (1984). Several studies have demonstrated the scale's sensitivity to change in social phobics receiving behavioral or cognitive-behavioral treatments (e.g., Butler et al., 1984; Heimberg, Dodge, et al., 1990).

The *Interaction Anxiousness Scale* (Leary, 1983) consists of 15 items describing the subjective cognitive-affective experience of anxiety during contingent interpersonal interactions. Items (e.g., "I often feel nervous even in casual get-togethers" and "I wish I had more confidence in social situations") are rated on a five-point scale of the degree to which they are characteristic of the subject. Cronbach's alphas of 0.88 and 0.89 and 8-week test-retest reliability of 0.80 have been reported with undergraduates (Jones et al., 1986; Leary, 1983). The Interaction Anxiousness Scale is highly correlated with other questionnaire measures of social interactional anxiety (Jones et al., 1986). High scorers on this measure were more likely to acknowledge that interpersonal anxiety was a problem for them and to express interest in a program for the reduction of interpersonal anxiety (Leary, 1983) and were more likely to expect negative evaluations from others in social interactions than low scorers (Leary, Kowalski, & Campbell, 1988).

The *Audience Anxiousness Scale* (Leary, 1983) consists of 12 items measuring the cognitive and affective experience of anxiety in public speaking and other noncontingent situations in which the individual is compelled to perform in front of others. The format is identical to that of the Interaction Anxiousness Scale, and sample items include "I usually get nervous when I speak in front of a group" and "When I speak in front of others, I worry about making a fool of myself." Leary (1983) has reported a Cronbach's alpha of 0.91 and an 8-week test-retest coefficient of 0.84. The Audience Anxiousness Scale is more highly correlated with measures of public speaking anxiety than with measures of social interactional anxiety. Speech majors achieved lower scores than other students, and high scorers were more likely than low scorers to report that public speaking and performing in front of others was a significant problem for them (Leary, 1983). The Audience and Interaction Anxiousness Scales were included in this study because they are commonly used in nonclinical populations, and their relative emphasis on contingent versus noncontingent interaction provides a test of the discriminant power of the SIAS and SPS.

The *Social Interaction Self-Statement Test* (Glass, Merluzzi, Biever, & Larsen, 1982) is a 30-item inventory that assesses positive and negative self-statements concerning heterosocial interaction. Items are rated on a scale of frequency of occurrence from 1 (hardly ever had the thought) to 5 (very often had the thought). In the original version, ratings are made in reference to a specific role-played interaction. However, other researchers, (Dodge, Hope, Heimberg, & Becker, 1988; Zweig & Brown, 1985) have instructed subjects to rate self-statements in reference to a real-life interaction. Sample positive self-statement items include "I can handle anything" and "This is an awkward situation but I can handle it." Sample negative

self-statement items include "I'm really afraid of what he/she thinks of me and I've just got to make a good impression on him/her or I'll feel terrible." Glass et al. (1982) report split-half reliabilities of 0.73 for positive self-statements and 0.86 for negative self-statements. Several studies have shown that socially anxious subjects report fewer positive and more negative self-statements than nonanxious subjects (Beidel, Turner, Dancu, 1985; Glass et al., 1982; Zweig & Brown, 1985) and self-statement scores have been related to criterion measures among undergraduates (Glass et al., 1982; Zweig & Brown, 1985), anxious community volunteers (Glass & Furlong, 1990), and social phobics (Dodge et al., 1988). For instance, both Glass et al. (1982) and Glass and Furlong (1990) report that self-statement scores were significantly related to partners' and judges' ratings of subjects' performance during a role-played social interaction.

The *Liebowitz Social Phobia Scale* (Liebowitz, 1987), a rating scale of fear and avoidance of social interaction and performance-oriented situations completed by a clinician during a semi-structured interview, was also administered to social phobic subjects. Sample social interaction subscale items include "meeting strangers" and "talking to people in authority." Sample performance subscale items include "speaking up at a meeting" and "acting, performing, or giving a talk in front of an audience." Each situation is rated on 0-3 scales of fear and avoidance. However, because fear and avoidance ratings have been shown to be highly correlated (Holt et al., in press-b), only fear ratings were utilized in this study. The Liebowitz Social Phobia Scale has not been previously used in studies of the behavioral treatment of social phobia, and no psychometric data have been reported. However, it is a common tool in studies of pharmacological treatment of social phobia (Liebowitz et al., 1988; Munjack et al., 1991; Reich & Yates, 1988). It was included in the present study because it assesses situational aspects of social phobia (i.e., social interaction vs. performance) that are relevant to the discriminant validity of the SIAS and SPS and because it does so in a manner other than paper-and-pencil assessment.

Summary

In general, it was expected that the SIAS and SPS would be significantly correlated with the majority of these measures. However, it was further hypothesized that the SIAS would show stronger relationships with other measures of social interactional anxiety (Social Avoidance and Distress Scale, Fear of Negative Evaluation Scale, Interaction Anxiousness Scale, Social Interaction Self-Statement Test, Social Interaction subscale of the Liebowitz Social Phobia Scale) although the SPS would show stronger relationships with measures of anxiety in performance or observation situations (Performance subscale of the Liebowitz Social Phobia Scale, Social Phobia subscale of the Fear Questionnaire, Audience Anxiousness Scale).

Procedure

Social phobic subjects completed the SIAS, SPS, Social Avoidance and Distress Scale, Fear of Negative Evaluation Scale, and Fear Questionnaire packet as part of a questionnaire given prior to treatment and completed at home. The Liebowitz Social Phobia Scale was administered by clinical interviewers (licensed psychologist, certified social worker, or psychiatrist) as part of pretreatment assessment.

Community subjects completed the SIAS, SPS, Fear of Negative Evaluation Scale, Fear Questionnaire, Interaction Anxiousness Scale, and Audience Anxiousness Scale while waiting in a quiet reception area or at home. Undergraduates completed the SIAS, SPS, Social Avoidance and Distress Scale, Fear of Negative Evaluation Scale, Interaction Anxiousness Scale, Audience Anxiousness Scale, and Social Interaction Self-Statement Test while seated in a quiet experimental area. Forty-one undergraduates returned between one and two weeks later to complete the SIAS and SPS a second time.

Results

Preliminary Analyses

Social phobics from CSAD and NYSPI were compared on the SPS, SIAS, and all other study measures using a series of independent-sample *t*-tests. No significant differences were found on any measure except the Liebowitz Social Phobia Scale. NYSPI subjects reported significantly greater fear on both the Performance ($t(64) = 2.62, p < .05$) and Social Interaction ($t(64) = 2.31, p < .05$) subscales. In the absence of other differences, however, the social phobic groups were combined for all further analyses.

Differences between Social Phobics and Community Subjects

As noted earlier, social phobics and community subjects did not differ on demographic characteristics. Means and standard deviations for the SIAS and SPS for each group are shown in Table 2. Also see Table 2 for Cronbach's alpha. For the SIAS, a gender by group (social phobic vs. community subjects) analysis of variance yielded main effects for group (social phobics scored higher, $F(1, 112) = 114.59, p < .001$) and gender (females scored higher, $F(1, 112) = 5.99, p < .02$) but no significant interaction. The analysis of the SPS yielded similar results; social phobics scored higher, $F(1, 112) = 69.65, p < .001$, and females scored higher, $F(1, 112) = 5.17, p < .05$, but the interaction effect was not significant.

In addition, we defined a "case" as a social phobic subject who scored one standard deviation above the mean of the community sample on either measure ($SIAS \geq 34$; $SPS \geq 24$). According to this definition, 54 of 66 social phobics (82%) were correctly classified and 9 of 50 community subjects (18%) were incorrectly classified as cases by the SIAS. Forty-eight of 66 social phobics (73%) were correctly classified and 6 of 50 community subjects (12%) were incorrectly classified as cases by the SPS. These differences were highly significant ($p < .0001$) according to Fisher's Exact Test.

Table 2. Means, Standard Deviations, and Cronbach's Alpha for the SIAS and SPS for Social Phobic, Community, and Undergraduate Samples

Sample	N	SIAS			SPS		
		M	SD	α	M	SD	α
Social Phobic	66	49.0	15.6	0.86	32.8	14.8	0.90
Female	26	53.4	14.2		35.4	10.9	
Male	40	46.1	16.0		31.1	16.8	
Community	50	19.9	14.2	0.90	12.5	11.5	0.93
Female	25	22.9	17.4		16.1	14.2	
Male	25	16.8	9.5		9.0	6.5	
Undergraduate	53	19.5	10.9	0.85	13.4	9.6	0.87
Female	19	18.1	8.1		15.6	10.7	
Male	34	20.2	12.2		12.1	8.9	

Note: SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale

Correlational Analyses

The correlation between the SIAS and SPS for the combined social phobic group was $r = .41$, for the community sample $r = .89$, and for the undergraduate sample $r = .52$ (all $ps < .001$). Tests for the significance of differences between independent correlations revealed that the correlation for the community subjects was significantly larger than it was for either the social phobic ($z = 5.12, p < .001$) or undergraduate ($z = 4.18, p < .001$) groups.^{3,4} The correlations between the SIAS and SPS for social phobics and undergraduates did not differ. Correlations with the other study measures (with correction for family-wise error within each sample) are reported in Table 3.

Social phobics

In order to test the ability of the SPS and SIAS to discriminate between social interactional anxiety and performance/observation fears, the scales were correlated with the Social Interaction and Performance subscales of the Liebowitz Social Phobia Scale and tested for differences between dependent correlations. After controlling for family-wise error, the SPS and SIAS were both significantly correlated with the Performance subscale of the Liebowitz Social Phobia Scale (see Table 3); however, only the SIAS was significantly correlated with the Social Interaction subscale. Importantly, correlations were significantly stronger between conceptually related measures. Although significantly related to both subscales, the SIAS was more highly correlated with Social Interaction than with Performance ($t(63) = 3.25, p < .01$). The SPS was more highly correlated with Performance than with Social Interaction ($t(63) = 3.91, p < .001$).⁵

Additional support for the discriminant validity of the SPS and SIAS with social phobics was found in their relationship to other self-report measures. The SPS was significantly correlated with the Social Phobia subscale of the Fear Questionnaire, a measure of avoidance in predominantly observation-oriented situations, although the SIAS was not. The degree of relationship between the Fear Questionnaire and the SPS was nearly significantly greater than the degree of relationship between the Fear Questionnaire and the SIAS ($t(63) = 2.18, p < .05$). Conversely, the SIAS was significantly correlated with the Social Avoidance

and Distress Scale, a measure of social interactional anxiety, and the Fear of Negative Evaluation Scale, a measure of concern about negative evaluation from others across the range of social situations, although the SPS was not. The magnitude of the difference was significant for the Social Avoidance and Distress Scale ($t(63) = 5.03, p < .001$) but not the Fear of Negative Evaluation Scale.

Table 3. Correlations of SIAS and SPS with Other Measures of Social Anxiety

	Social Phobic ($n = 66$)		Community ($n = 50$)		Undergraduate ($n = 53$)	
	SIAS	SPS	SIAS	SPS	SIAS	SPS
LSPS Subscales						
Social	.69*	.29				
Performance	.45*	.60*				
SADS	.74*	.28			.62*	.43*
FNE	.44*	.28	.82*	.79*	.68*	.48*
FQ-SP	.36	.59*	.76*	.73*		
IAS			.88*	.80*	.82*	.48*
AAS			.68*	.71*	.62*	.53*
SISST-P					-.56*	-.16
SISST-N					.69*	.43*

Note: SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale; LSPS = Liebowitz Social Phobia Scale; SADS = Social Avoidance and Distress Scale; FNE = Fear of Negative Evaluation Scale; FQ-SP = Social Phobia subscale of the Fear Questionnaire; IAS = Interaction Anxiousness Scale; AAS = Audience Anxiousness Scale; SISST-P = Positive self-statement subscale of the Social Interaction Self Statement Test; SISST-N = Negative self-statement subscale of the Social Interaction Self Statement Test

* r is statistically significant at $p < .05$ divided by the number of correlations presented for each sample: for social phobics, $p < .05/10 = .005$; for community subjects, $p < .05/8 = .00625$; for undergraduates, $p < .05/12 = .00417$.

Community subjects

As seen in Table 3, correlations between the SIAS and SPS and other measures tended to be uniformly high ($0.69 < r_s < 0.88$). Few significant differences appeared in the strength of association between specific measures and the SIAS and SPS, not surprising given their high intercorrelation in this group. Even so, a few differences did appear which support the relative specificity of the SIAS as a measure of anxiety in social interactional settings. The correlation between the SIAS and the Interaction Anxiousness Scale was nearly significantly greater than the correlation between the SPS and this scale ($t(47) = 2.30, p < .05$). The SIAS was more strongly related to the Interaction Anxiousness Scale than it was to the Audience Anxiousness Scale, a measure of fear in public speaking and performance situations, ($t(47) = 3.92, p < .001$). The SIAS and SPS were not differentially related to the Audience Anxiousness Scale, the Social Phobia subscale of the Fear Questionnaire, or the Fear of Negative Evaluation Scale among the community subjects.

College students

Correlations for the undergraduate sample also tended to be strong, especially for the SIAS. As with the community subjects, the pattern of correlations supported the specificity of the SIAS as a measure of social interactional anxiety. The SIAS was more strongly related than the SPS to the Interaction Anxiousness Scale ($t(S0) = 4.44, p < .001$). The relationship between the SIAS and the Interaction Anxiousness Scale was again significantly stronger than the relationship between the SIAS and the Audience Anxiousness Scale ($t(S0) = 3.96, p < .001$). The SIAS was more strongly related than the SPS to the positive self-statement subscale of the Social Interaction Self-Statement Test ($t(50) = 3.55, p < .001$) and tended to be more strongly related to the negative self-statement subscale ($t(50) = 2.61, p < .02$). The SIAS and the SPS were not differentially related to the Audience Anxiousness Scale, the Social Avoidance and Distress Scale or the Fear of Negative Evaluation Scale in the college student sample.

The correlations between repeated administrations were $r = .86$ for the SIAS and $r = .66$ for the SPS (both $ps < .001$).

Differences between Subtypes of Social Phobia

In order to look at the ability of the SIAS and SPS to predict subtype of social phobia, a subtype (generalized vs. nongeneralized) by gender analysis of variance was conducted for each scale (2 subjects whose subtype designation was unavailable were omitted from this analysis). The analysis of the SIAS yielded a significant main effect for subtype (generalized social phobics, $M = 54.00, SD = 13.37$; nongeneralized social phobics, $M = 38.78, SD = 13.76$; $F(1, 60) = 16.67, p < .001$), but the SPS analysis did not yield a significant subtype effect. The main effect for gender and the interaction effect were not significant in either analysis.

Comparison of Social Phobics to Mattick-Clarke Sample

A final question we addressed was the comparability of the current sample of social phobics to the social phobic sample ($n = 243$) reported by Mattick and Clarke (1989). In their research program (Mattick & Peters, 1988; Mattick et al., 1989), patients are described as having severe, but specific (i.e., performance-oriented) social phobias. Our patients (Heimberg, Dodge, et al., 1990) have been characterized by more broadly generalized social interactional concerns, and thirteen of a recent series of 33 patients (39.4%) also met DSM-III-R criteria for avoidant personality disorder (Holt et al., in press-a). Therefore, we expected that our patients might achieve higher scores on the SIAS but Mattick and Clarke's patients would score higher on the SPS. In a post hoc analysis, this was indeed the case for the SIAS (Mattick-Clarke $M = 37.0, SD = 16.9$; $t(307) = 21.35, p < .001$) and the SPS (Mattick-Clarke $M = 40.0, SD = 16.0$; $t(307) = 13.16, p < .001$).

Discussion

The present study attempted to provide validation support for the use of the SPS and SIAS in studies of social phobia and social anxiety, and our findings do provide that sup-

port. Several lines of evidence converge to support the utility of these scales: they discriminate social phobics from community volunteers, and they are significantly correlated with other self-report measures of social anxiety and social phobia. Furthermore, the SIAS was more strongly related to several measures of social interactional anxiety and self-statements in social situations and the SPS was more strongly related to measures of performance/observation fear. This was the case regardless of the method of assessment, self-report or clinician rating. Social phobic subtypes also achieved predicted patterns of response on the SIAS and SPS. These data, together with the unpublished findings of Mattick and Clarke (1989) that the SIAS and SPS discriminated social phobics from patients with other anxiety disorders and of Mattick and Peters (1988) and Mattick et al. (1989) that the scales are responsive to treatment change, provide a strong basis for the utility of these scales.

Social phobics obtained higher scores on the SIAS and SPS than community subjects. In fact, 82% of the social phobics scored a standard deviation or more above the mean of the community sample for the SIAS, and 73% of the social phobics did so for the SPS. Thus both scales showed excellent sensitivity to the presence of social phobia. These differences occurred despite the fact that no formal diagnostic screening could be conducted with community subjects, and we cannot be certain that some persons with clinically significant social anxiety did not find their way into the community sample. Although a formal diagnostic interview for these subjects would clearly have been preferred, the inability to do so should diminish group separation and render the conclusion of sensitivity all the more conservative. We were also unable to include a group of other anxiety disorder patients in the current study. Mattick and Clarke (1989), however, found social phobics to score higher on both the SIAS and SPS than agoraphobic subjects.

Among social phobics, the SIAS was more strongly related to the Social Avoidance and Distress Scale and the Liebowitz Social Phobia Scale Social Interaction subscale, both of which measure social interactional anxiety. The finding that the SPS was more highly related to the Liebowitz Social Phobia Scale Performance subscale and tended to be more highly related to the Social Phobia subscale of the Fear Questionnaire, measures more closely associated with performance/observation fears, provides further evidence of the scales' discriminant power among social phobics.

Despite its failure to achieve significance after alpha correction, the finding for the Social Phobia subscale of the Fear Questionnaire is of interest since this was the only measure in the battery specifically designed to assess interference in functioning due to *avoidance* of specific performance situations (three Fear Questionnaire items assess avoidance of being observed, speaking in public and eating in front of others). This suggests additional hypotheses about the SIAS, SPS, and social phobia that bear further examination: (1) the SPS may tap a dimension of avoidance as well as anxiety, (2) SPS items may have greater situational specificity than SIAS items, and/or (3) social interactional situations may be more difficult for social phobics to avoid than performance/observation situations.

In both the community and undergraduate groups, the SIAS was more highly related to the Interaction Anxiousness Scale than was the SPS (a near-significant trend for the undergraduates, see Footnote 3) and the relationship between the SIAS and the Interaction Anxiousness Scale was greater than the relationship between the SIAS and the Audience Anxiousness Scale. Both these findings support the validity of the SIAS. The SIAS was also

more strongly related to the positive self-statement subscale of the Social Interaction Self-Statement Test and tended to be more strongly related to the negative self-statement subscale in the undergraduate group. However, in neither sample was the SPS more strongly related to the Audience Anxiousness Scale, a specific measure of public speaking fear. The lack of a stronger correlation between the SPS and Audience Anxiousness Scale may have been a function of the more limited range of observational situations assessed by the Audience Anxiousness Scale or the pervasiveness of public speaking concerns in nonclinical populations.

Both the SIAS and SPS demonstrated good internal consistency, but our attempt to measure temporal stability among undergraduates produced mixed results. The SIAS appears to have good temporal stability, but the SPS was less stable in this population. This finding stands in contrast to data reported by Mattick and Clarke (1989) with a clinical sample. They reported test-retest coefficients for both the SPS and SIAS of 0.91 to 0.93 for intervals of 3 to 13 weeks in small samples of untreated social phobics. This discrepancy may be a result of a restricted range of scores in the nonclinical population. However, it warrants further examination.

A problematic finding for the psychometric development of the SIAS and the SPS is the high degree of intercorrelation between the two scales in the community sample. Reanalysis with outliers eliminated reduced the magnitude of this relationship, but it remained substantial, suggesting that the community subjects did not discriminate between the types of situations assessed by the two scales. Although the reasons for this finding are unclear, scale intercorrelation was not problematic for the college students or, most importantly, for the social phobics. In these two samples, the SIAS and SPS provided information on different aspects of social anxiety. Especially among social phobics, this conclusion is supported by different patterns of relationships between the SIAS and SPS and the other measures of social interactional and performance anxiety.

The SIAS discriminated among generalized and nongeneralized social phobics, but the SPS did not. To some extent, this is a difficult finding to interpret. A comparison between social phobics with fears only in social interactional situations and social phobics with fears only in observation situations would have provided the most discriminating test of the SPS and SIAS. However, DSM-III-R defines subtypes in terms of the range and breadth of situations feared rather than the specific types of situations feared. To be most in line with DSM-III-R, we chose to evaluate the SIAS and SPS responses of generalized and nongeneralized social phobics. In fact, these two subgroups performed according to expectation, with generalized social phobics achieving more extreme scores on the SIAS and both groups showing elevations on the SPS.

The comparison between our sample of social phobics and those included in the report by Mattick and Clarke (1989) revealed interesting differences. Our sample achieved higher scores on the SIAS and the Australian group achieved higher scores on the SPS. Both samples, however, achieved scores much higher than their respective normal controls. As noted above, this may have been the result of differences in patients studied in the two investigations, our patients reporting greater social interactional anxiety and the Australian patients reporting greater performance anxiety. It may also have been influenced by the use of DSM-III-R in our study and DSM-III by Mattick and Clarke (1989). Speculatively,

this finding raises questions about possible differences in diagnostic practices or other cultural factors that may affect the presentation of social phobia in the two countries and warrants further study.

Limitations in the design of the current study should be acknowledged. As noted above, it would have been preferable to include a group of patients with anxiety disorders other than social phobia. Not only would this have furthered the efforts of Mattick and Clarke (1989) to demonstrate the specificity of extreme SIAS and SPS responses to social phobia, but it would also have allowed a closer examination of social anxiety features in other anxious patients. Rapee, Sanderson, and Barlow (1988) have demonstrated the presence of social anxiety symptoms in several other categories of anxiety disordered patients, and Turner et al. (1987) have shown other anxiety disordered patients to achieve high scores on the Social Avoidance and Distress Scale and the Fear of Negative Evaluation Scale.

Clearly, further study of the responses of anxious patients to the SIAS and SPS is warranted. It would also have been preferable to administer the same diagnostic interview to the community subjects as was administered to the social phobics, although our inability to do so had the likely result of increasing the heterogeneity of the community sample and making it more, rather than less, difficult to demonstrate differences between groups. Finally, we did not obtain specific measures of interrater agreement for the diagnosis of social phobia with the ADIS-R or SADS-LA within the context of this study, although both interview schedules are known to be highly reliable in the hands of experienced interviewers.

Two additional areas of further research with the SIAS and SPS deserve mention. First, although this study and Mattick and Clarke (1989) present evidence of convergent validity with several measures of interactional and performance anxiety, only the Fear Questionnaire and the Liebowitz Social Phobia Scale were developed specifically for use with social phobics. However, since the initiation of this study, Turner et al. (1989) have published the Social Phobia and Anxiety Inventory (SPAI), and a number of studies of its psychometric properties have been reported (e.g., Beidel, Borden, Turner, & Jacob, 1989; Beidel, Turner, Stanley, & Dancu, 1989). Studies of the relationships between the SIAS, SPS, and SPAI, and the relative strength of their relationships to criterion measures are clearly warranted. Second, there is a need for further research in the area of gender differences in response to the SIAS and SPS. Although not a primary focus of the present study, women in the social phobic/community group analysis achieved significantly higher scores on both scales. Gender differences in social phobia have yet to be systematically addressed (Heimberg, 1989).

In summary, this study provided validation support for the use of the SIAS and SPS with clinical, community, and undergraduate samples. Although the support for the reliability and validity of the SIAS was somewhat stronger than that for the SPS, the scales may increase our options for the assessment of social phobia. These scales may also be of use in determination of subtype of social phobia and in the analysis of the types of situations feared by social phobic patients.

Acknowledgments – This study was supported by NIMH grants 44119 to Richard G. Heimberg and 40121 to Michael R. Liebowitz. Portions of this paper were presented at the annual meeting of the

Association for the Advancement of Behavior Therapy, San Francisco, November, 1990. Thanks to Randy O. Frost for his comments on an earlier draft of this manuscript.

Notes

1. The Social Phobia and Anxiety Inventory (SPAI; Turner, Beidel, Dancu, & Stanley, 1989) meets the criteria stated above, i.e., it was developed with social phobics and normative and validation data have been reported. However, it was not published until after the initiation of the current research.
2. A copy of the screening protocol is available from the first author on request.
3. All tests for differences between correlations reported in the "Correlational Analysis" section have been evaluated after correction for the total number of tests in a family of tests. Thus, the minimal acceptable significance level in the analyses of differences between SIAS-SPS correlations was .05/3 or .017. Tests of differences between correlations in the social phobic sample were evaluated against an alpha of .05/5 = .01. For the community sample, alpha was set at .05/6 = .00833, and for the college students, alpha was set at .05/8 = .00625. Any test significant at a level between .05 and the adjusted alpha was considered a "near-significant trend" and reported accordingly.
4. The magnitude of the correlation between the SPS and the SIAS for the community subjects ($r = .89$) was much larger than expected. To further examine this correlation, we studied the scatterplot of SPS and SIAS scores and searched for outliers (defined before examining the scatterplot as subjects who achieved scores two or more standard deviations above the mean on both measures simultaneously). Five subjects were classified as outliers, and all analyses reported in this paper involving community subjects were repeated with the outliers removed. The correlation between the SPS and SIAS for community subjects was reduced to $r = .79$, still significantly greater than the same correlation for the social phobics and college students. Of course, the deletion of outliers also reduced the mean scores of the community subjects on the SPS and SIAS, with the result that the magnitude of social phobic-community sample differences was increased and the magnitude of correlations between each scale and other questionnaires for community subjects (see Table 3) was minimally decreased. Because of the *post hoc* nature of these analyses, they are not reported further in this paper. Full details are available from the first author.
5. As noted above, there were significant differences between social phobic groups on the Liebowitz Social Phobia Scale (LSPS), with subjects from NYSPI scoring higher on both subscales. Therefore, we conducted further analyses of the LSPS-SIAS and LSPS-SPS relationship separately for CSAD and NYSPI social phobics. Tests of differences between independent correlations revealed no difference in patterns between CSAD and NYSPI subjects on the relationship between the SIAS and LSPS subscales. For the SPS, however, the r with the Performance subscale was greater for NYSPI than CSAD (.77 vs .44; $Z = 2.11, p < .05$). This analysis was followed by separate analyses of the relationship between the SPS and the two LSPS subscales for each site. For each site and for the sample as a whole, the r between the SPS and the Performance subscale remained significantly greater than that between the SPS and Social subscale (CSAD: $t(37) = 2.57, p < .02$; NYSPI: $t(23) = 2.85, p < .01$; Combined: $t(63) = 3.91, p < .001$). Combined data are reported in text since there were no differences in patterning.

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