The Appraisal of Social Concerns Scale: Psychometric Validation With a Clinical Sample of Patients With Social Anxiety Disorder

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The Appraisal of Social Concerns (ASC) Scale was created by Telch et al. (2004) to improve upon existing self-report measures of social anxiety–related cognition. In a largely nonclinical sample, the ASC was found to possess three factors and was psychometrically sound. In a smaller clinical sample, the ASC demonstrated sensitivity to the effects of cognitive behavioral therapy. In the present study, the psychometric properties of the ASC were examined in a larger sample of patients with social anxiety disorder. In this sample, the ASC exhibited a 2-factor structure; the nature of the factors was similar to the primary factors originally reported by Telch et al. The ASC also demonstrated strong validity, internal consistency, and sensitivity to treatment effects. It is concluded that the ASC may be useful in the assessment of cognition and cognitive change in patients with social anxiety disorder.

INDIVIDUALS WITH SOCIAL ANXIETY DISORDER experience persistent and often intense fears related to social interaction or performance situations in which they anticipate scrutiny by others (American Psychiatric Association [APA], 2000). At some point in their lives, more than 12% of the population meet diagnostic criteria for this disorder (Kessler, Berglund, et al., 2005), although estimates of the prevalence of clinically significant social anxiety disorder are closer to 4% (Narrow, Rae, Robins, & Regier, 2002). Once considered the neglected anxiety disorder (Liebowitz, Gorman, Fyer, & Klein, 1985), increasing knowledge of the prevalence and impact of social anxiety disorder has led researchers to examine the mechanisms of its maintenance, and several theorists have suggested that cognitive factors are likely to be especially important (Amir & Foa, 2001; Clark & Wells, 1995; Rapee & Heimberg, 1997).

A central fear in social anxiety disorder is of negative evaluation, and this fear may be maintained in several ways. For instance, compared to controls, individuals with social anxiety disorder overestimate the likelihood that negative social events will occur, underestimate the likelihood that positive social events will occur, and appraise negative social events as substantially more costly (Foa, Franklin, Perry, & Herbert, 1996; McManus, Clark, & Hackmann, 2000; Poulton & Andrews, 1994). Furthermore, as delineated by recent cognitive behavioral models of social anxiety (Clark & Wells, 1995; Rapee & Heimberg, 1997), individuals with social anxiety disorder are likely to enter a social situation with negative predictions concerning the situation's outcome, which may be related to biases in the allocation of attention toward threat and in the tendency to interpret ambiguous situations as negative. This process acts to maintain anxiety (see reviews of attentional and interpretational biases in social anxiety by Hirsch

& Clark, 2004; Ledley & Heimberg, in press). Therefore, it is likely that individuals experiencing social anxiety assume that threat is always present in social situations (Heimberg & Becker, 2002).

Persons with social anxiety disorder commonly engage in avoidance behaviors and isolate themselves from social interaction (e.g., as reviewed by Rapee & Heimberg, 1997), making it unlikely that they will receive disconfirmatory feedback, which might otherwise allow for emotional processing of feared stimuli (Foa & Kozak, 1986). Furthermore, it has been demonstrated that, with successful treatment, socially anxious individuals rate the probability of negative social events as less likely (Foa et al., 1996; McManus et al., 2000) and the cost of such events as less catastrophic (Foa et al., 1996; Hofmann, 2004; McManus et al., 2000). Foa et al. and Hofmann have concluded that changes in negative cognitions may mediate anxiety reduction in social anxiety disorder. These findings underscore the central role of cognition in social anxiety disorder as well as the importance of valid and reliable assessment of these cognitive features. Such assessment may better elucidate the nature of social anxiety morbidity, maintenance, and symptom reduction.

Telch et al. (2004) introduced the Appraisal of Social Concerns (ASC) scale as a tool to measure distress related to negative outcomes in challenging social situations and to improve upon the noted shortcomings of existing cognitive assessment scales (also see Hofmann & DiBartolo, 2000) such as the Irrational Beliefs Test (Jones, 1969), the Social Interaction Self-Statement Test (Glass, Merluzzi, Biever, & Larsen, 1982), the Fear of Negative Evaluation Scale (Watson & Friend, 1969), and unstructured thought-listing protocols. Telch et al. contend that the ASC offers the benefit of asking participants to rate the degree to which they feel concerned about social threat, as opposed to rating the frequency and cost of past negative social outcomes, of which they may not be completely aware. Therefore, the instructions of the ASC direct respondents to think about themselves in social situations and rate their concerns with the listed negative social negative outcomes, as opposed to directing them to indicate the frequency of or distress related to these outcomes.

The ASC directs the respondent to rate the degree to which he or she *would be* concerned by the particular outcomes if they occurred in challenging social situations. It consists of three subscales based on factor analyses of the responses of 550 college undergraduates: Negative Evaluation, Observable Symptoms, and Social Helplessness. According to Telch et al. (2004), the Negative Evaluation subscale measures the degree to which the respondent is concerned with the negative judgments of others in social situations (e.g., "People ridiculing you"; "Appearing weird"). The Observable Symptoms subscale assesses the degree to which the respondent is concerned with experiencing (ostensibly) visible physical symptoms (e.g., "Twitching"; "Blushing") in social situations. The Social Helplessness subscale presumably measures the respondent's concern with experiencing social outcomes beyond his or her control (e.g., "Losing control [screaming, running out, etc.]"). The psychometric properties of the ASC were initially established in this sample as well as a smaller sample of individuals with social anxiety disorder ($N = 86$; Telch et al., 2004). The authors concluded that the ASC has strong psychometric properties, including good internal consistency and test-retest reliability, good convergent and discriminant validity, as well as sensitivity to treatment effects. Telch et al. further suggest that the ASC may aid the clinician in focusing on specific targets for intervention.

It is both logical and imperative to further examine the psychometric characteristics of the ASC in a large, clinical sample of socially anxious patients. In the current study, data from a sample of 204 patients with social anxiety disorder were analyzed. We examined the factor structure to determine if the data from this clinical sample would fit Telch et al.'s three-factor solution, which was derived from their undergraduate sample. We also examined the internal consistency of the ASC as well as its convergence with measures of social anxiety and divergence with measures of other constructs. Effect sizes were also calculated to determine the ASC's sensitivity to the effects of cognitive behavioral group therapy (Heimberg & Becker, 2002); the monamine oxidase inhibitor phenelzine sulfate, which has also been shown to be efficacious in the treatment of social anxiety (Heimberg et al., 1998); and pill placebo.

Method

PARTICIPANTS

Participants included in this study were 204 treatment-seeking individuals who met *DSM-IV* criteria for social anxiety disorder (see below for additional information about the diagnosis of participants). Local referrals and newspaper advertisements were employed to recruit participants at the Anxiety Disorders Clinic of the New York State Psychiatric Institute, New York, NY ($n = 57$), the Center for Stress and Anxiety Disorders of the University at Albany, State University of New York ($n = 24$), and the Adult Anxiety Clinic of Temple

University, Philadelphia, PA ($n = 123$). The Anxiety Disorders Interview Schedule for *DSM-IV*, Lifetime Version (DiNardo, Brown, & Barlow, 1994) was employed in Albany and Philadelphia, whereas the Structured Clinical Interview of *DSM-IV* (First, Spitzer, Gibbon, & Williams, 1997) was used in New York. Inclusion criteria were a principal diagnosis of social anxiety disorder, age between 18 and 65 years old, fluency in English, ability to participate responsibly in treatment, and willingness to provide informed consent. Exclusion criteria included a principal diagnosis other than social anxiety disorder as well as active suicidal intent. Individuals with major depressive disorder were excluded at the New York site, but not at the Albany and Philadelphia sites. Individuals receiving a principal diagnosis of social anxiety disorder were offered participation in a randomized controlled trial comparing cognitive behavioral group therapy (CBGT), phenelzine sulfate (a monoamine oxidase inhibitor), a combination of phenelzine and CBGT, and pill placebo. Participants at the Albany and Philadelphia sites who refused treatment in the randomized controlled trial or who were excluded for medical reasons were offered open treatment with CBGT. These individuals were assessed in the same manner as those who participated in the randomized controlled trial. The data utilized in the present study are a subset of those collected at each client's pretreatment assessment. In addition, post-treatment data were analyzed for those clients receiving CBGT ($n = 43$), phenelzine sulfate ($n = 25$), and pill placebo ($n = 18$).

MEASURES

All study participants were evaluated with semi-structured diagnostic interviews and all completed the ASC. Participants also completed measures that were utilized to assess the convergent and discriminant validity of the ASC.

The Appraisal of Social Concerns Scale. The ASC (Telch et al., 2004) is a 20-item self-report measure assessing respondents' concern with potentially negative outcomes arising in social situations. The instructions direct the respondent to "choose a number from the scale . . . which best describes the degree to which you would be concerned by the particular outcome when placed in a challenging social situation" (p. 219). "Talking to people at a party" and "public speaking" are provided as general examples of social situations in which each particular outcome may occur, but to which each outcome is not limited. The response scale ($0 = not\ at\ all\ concerned$ to $100 = extremely\ concerned$) is marked in intervals of 10 and the scale score is reported as the average item rating. Items

include outcomes such as "Trembling," "People laughing at you," and "Not performing adequately." In a nonclincial sample, the ASC demonstrated excellent internal consistency ($\alpha = .94$), but internal consistency for the clinical sample was not reported. In the clinical sample, the ASC evidenced good convergent validity, as it was moderately correlated with other self-report measures of social anxiety, such as the Social Phobia and Anxiety Inventory (SPAI; Turner et al., 1989), and the Social Phobia Scale and Social Interaction Anxiety Scale (Mattick & Clarke, 1998). Furthermore, when the median score on the SPAI was used to split their clinical sample into more and less socially anxious participants, the ASC correctly identified 77.1% of the high social anxiety group and 80% of the low social anxiety group. Telch et al. also found the ASC to be sensitive to the treatment effects of cognitive behavioral therapy with large pre-post effect sizes for patients treated in individual ($d = 1.5$) and group ($d = 1.13$) cognitive-behavioral therapy.

Semistructured diagnostic interviews. Anxiety Disorders Interview Schedule for DSM-IV, Lifetime Version (ADIS-IV-L; DiNardo, Brown, & Barlow, 1994). The ADIS-IV-L is a semistructured diagnostic interview that assesses the presence, nature, and severity of *DSM-IV* anxiety, somatoform, mood, and substance-related disorders. Interviewers at the Philadelphia and Albany sites followed the training protocol established by Brown, DiNardo, Lehman, and Campbell (2001). In accordance with this protocol, trainees observed three live interviews, which were conducted by a senior interviewer. During observation, trainees made ratings and independently derived diagnoses and associated ratings of severity. At the conclusion of the interview, ratings and diagnoses were compared and discussed. Trainees then conducted three diagnostic interviews in the presence of the senior interviewer, who assisted with the evaluation when necessary. Interviewers were considered fully trained when they matched ratings with senior interviewers on the principal diagnosis, its severity rating, and the presence of all other current diagnoses in the evaluation of three consecutive patients.

The ADIS-IV-L has been demonstrated to have strong interrater reliability in the diagnosis of social anxiety disorder ($\kappa = .77$; Brown et al., 2001). In the current study, patients at the Albany and Philadelphia sites were evaluated with all modules of the ADIS-IV-L at their initial visit. A second assessor administered the social anxiety disorder module of the ADIS-IV-L to a subset of patients at a subsequent evaluation prior to the start of treatment. There was 100% agreement on the principal diagnosis of social

anxiety disorder and 100% agreement (within 1 point) on the rating of clinical severity for the patients who received both interviews.

Structured Clinical Interview for DSM-IV, Patient Version (SCID-IV; First et al., 1997). The SCID-IV is a commonly utilized assessment interview that yields *DSM-IV* diagnoses. Training on the administration of the SCID-IV was similar to that on the ADIS-IV-L. Ventura, Liberman, Green, Shaner, and Mintz (1998) found strong agreement on symptoms ($\kappa = .76$) and good diagnostic accuracy (83%) in a general clinical sample when neophyte SCID-IV evaluators' ratings were compared to the ratings of experienced evaluators over a 5-year period. Reliability ratings for SCID-IV diagnoses were not available for this sample.

Measures to evaluate the convergent validity of the ASC. Brief Fear of Negative Evaluation Scale (BFNE; Leary, 1983). The 12-item BFNE measures concern about evaluation by others and distressing thoughts about receiving criticism and disapproval from others. The BFNE was derived from the 30-item Fear of Negative Evaluation Scale (Watson & Friend, 1969) and it is highly correlated with the original true/false scale ($r = .96$; Leary, 1983). It is rated on a Likert-type scale (1 = *not at all characteristic of me*; 5 = *extremely characteristic of me*). Example items include "Sometimes I think I am too concerned with what other people think of me" and "I become tense and jittery if I know someone is sizing me up." Weeks et al. (2005) reported high internal consistency ($\alpha = .89$) in a sample of patients with social anxiety disorder. They also reported the BFNE to have strong convergent validity, with high correlations with the Liebowitz (1987) Social Anxiety Scale, the Social Interaction Anxiety Scale (Mattick & Clarke, 1998) and the Social Phobia Scale (Mattick & Clarke, 1998). Weeks et al. found the BFNE's discriminant validity to be strong as well, as demonstrated by modest correlations with the Anxiety Sensitivity Index (Reiss, Peterson, Gursky, & McNally, 1986) and the Beck Depression Inventory (Beck, Rush, Shaw, & Emery, 1979). However, the BFNE was unexpectedly highly correlated with the Penn State Worry Questionnaire (Meyer, Miller, Metzger, & Borkovec, 1990). Confirmatory factor analyses of the BFNE in both undergraduate and clinical samples have shown that a two-factor model best fits the data, with one factor comprised of straightforwardly worded items and the other comprised of reverse-scored items (Rodebaugh et al., 2004; Weeks et al., 2005). Further, the BFNE is more strongly correlated with measures of social anxiety when reverse-scored items are removed (Weeks et al.). Thus, in the present study, the BFNE

was utilized as a measure of convergent validity; however, only straightforwardly worded items were included.

Social Interaction Anxiety Scale and Social Phobia Scale (SIAS, SPS; Mattick & Clarke, 1998). The SIAS is a 20-item scale that measures social anxiety as experienced in social interactions in dyads or groups. Example items include "I get nervous if I have to speak with someone in authority (teacher, boss, etc.)" and "I tense up if I meet an acquaintance in the street." The SPS is a 20-item scale created to measure social anxiety experienced when one is being observed engaging in some activity. Example items include "I become anxious if I have to write in front of other people" and "I get tense when I speak in front of other people." Instructions on both measures ask participants to "Indicate the degree to which you feel the statement is characteristic of you," and responses on both measures are made on a Likert-type scale ranging from 0 (*not at all*) to 4 (*extremely*). Both the SIAS and SPS have been shown to have high internal consistency (ranging from .88 to .94) and high temporal stability (between .91 and .93) in clinical samples. Both measures discriminate between clinical and nonclinical samples and between patients with social anxiety and those with other anxiety disorders (Brown et al., 1997; Heimberg, Mueller, Holt, Hope, & Liebowitz, 1992). Both the SIAS and SPS are more strongly correlated with scores on other social anxiety measures than with measures of general distress (Heimberg et al., 1992; Mattick & Clarke, 1998) and have demonstrated treatment sensitivity (Ries et al., 1998).

Anxiety Sensitivity Index (ASI; Reiss et al., 1986). The ASI is a 16-item self-report measure. Its items tap the fear of potential negative consequences of anxiety, specifically the fear of anxiety-related (generally physical) symptoms and the degree to which they are considered catastrophic. The consequences of such symptoms include additional fear and anxiety, embarrassment, illness, and loss of control. Example items include "When I cannot keep my mind on a task, I worry that I might be going crazy" and "It scares me when I feel faint." Likert-type responses range from 0 (*very little*) to 4 (*very much*). Test-retest reliability was found to be adequate, $r = .75$ (Reiss et al., 1986). The reliability and validity of the ASI have since been supported in a number of studies (see review by Peterson & Plehn, 1999). Reiss et al. (1986) reported higher ASI scores for patients with agoraphobia than patients with other anxiety disorders. More recently, patients with social anxiety disorder experiencing situationally bound panic attacks have been found to exhibit higher ASI

scores than those without panic attacks (Scott et al., 2000). Zinbarg, Barlow, and Brown (1997) found the ASI to consist of three factors: Factor 1 assessing fears of physical sensations (*Physical Concerns*), Factor 2 assessing fears of mental incapacitation (*Mental Incapacitation*), and Factor 3 assessing fears of social consequences of anxiety (*Social Concerns)*. Only the Social Concerns subscale was considered a measure for the evaluation of the convergent validity of the ASC.

Measures to evaluate the discriminant validity of the ASC. Beck Depression Inventory (*BDI; Beck et al., 1979*). The BDI is a 21-item self-report measure designed to assess somatic, affective, and cognitive symptoms of depression with graded self-descriptive statements. Significant research has demonstrated the BDI's convergent, divergent, and construct validity, as well as its reliability. Beck, Steer, and Garbin (1988) conducted a meta-analysis on the BDI from the years 1961 to 1986, finding a mean alpha of .86 for psychiatric samples. Also for psychiatric patients, Beck et al. (1988) found the BDI to be correlated .73 (on average) with the Hamilton (1960) Rating Scale for Depression, .76 with the Zung (1965) Self-Reported Depression Scale, and .76 with the MMPI Depression Scale. The BDI has excellent internal consistency in socially anxious individuals ($\alpha = .89$; Coles et al., 2001).

Anxiety Sensitivity Index (*ASI; Reiss et al., 1986*). The Physical Concerns and Mental Incapacitation subscales of the ASI were considered to be measures for the evaluation of the discriminant validity of the ASC.

PROCEDURE

Individuals interested in treatment at the three sites were initially screened and subsequently scheduled for assessments prior to their inclusion in the treatment study. Pretreatment assessments included the administration of a structured diagnostic interview (ADIS-IV-L or SCID-IV), the collection of demographic information, the completion of a battery of self-report measures, and other assessments not reported here.

A subset of patients was further assessed by an independent evaluator prior to starting the 12-week treatment protocol and again upon completion. All self-report measures were also re-administered at posttreatment. CBGT was administered to groups ranging from five to seven patients and was conducted by a psychologist and an accompanying cotherapist. The treatment protocol focused primarily on cognitive restructuring of dysfunctional thought patterns, exposure to feared social situations, and homework assignments that were completed between sessions. Further information about

this treatment is available in Heimberg and Becker (2002) and Turk, Heimberg, and Hope (2001). The full sample is not included in the analyses of treatment sensitivity, as only patients who completed treatment were considered. Similarly, only treatment completers in the phenelzine and placebo conditions of the larger treatment outcome study were included in treatment sensitivity analyses.

Results

PRELIMINARY ANALYSES

Demographic characteristics of patients from the three collaborative sites (Albany, Philadelphia, and New York) are presented in Table 1. Comparisons across sites revealed no differences in age, gender, marital status, or education. However, there were site differences in ethnicity, as the New York sample was more racially diverse than the Albany and Philadelphia samples, which were both predominantly Caucasian. Furthermore, ethnicity was related to full-scale ASC scores, as Caucasian participants scored 6.06 points lower than non-Caucasians, $t(1, 200) = 2.04$, $p = .043$. This significant difference among ethnic groups persisted when measures of social anxiety (i.e., SIAS, SPS, and BFNE) were controlled, $F(1, 191) = 4.87$, $p = .03$. Therefore, it appears that the ethnic groups in the present sample may differ specifically in terms of the appraisal of social threat.

There were no site differences on the mean scores of any measures used in the current study (see Table 2). On average, clients endorsed clinically significant levels of fear in 6.62 social situations ($SD = 2.13$) in response to the social phobia module of the ADIS-IV-L. A minority (46.5%) of clients endorsed 4 or more panic-related symptoms in social situations,[1] and the mean number of clinically significant symptoms reported was 3.61 ($SD = 2.56$). The number of panic symptoms experienced in social situations correlated .39 ($p < .05$) with the ASI's Social Concerns subscale.

DESCRIPTIVE STATISTICS FOR THE ASC IN PATIENTS WITH SOCIAL ANXIETY DISORDER

For the full sample, the ASC total score was normally distributed, with kurtosis of –0.25 and skewness of –0.28. The mean score was 51.92 ($SD = 20.11$). The ASC demonstrated strong

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[1] Data related to the rapid onset of panic symptoms were not available to calculate the actual prevalence of situationally bound panic attacks. Therefore, the present study reports only percentage of patients experiencing the necessary number of panic symptoms (four) to qualify for a panic attack. However, it should be noted that without information regarding the rapid onset of symptoms, it cannot be concluded that these patients experience panic attacks per se.

Table 1
Descriptive characteristics of the total sample and patients from the three collaborative sites

	Total sample (N=204)		Albany (n=24)		Philadelphia (n=123)		New York (n=57)		χ^2
	n	%	n	%	n	%	n	%	
Gender									0.85
Female	83	41.3	8	33.3	52	43.3	23	40.4	
Male	118	58.7	16	66.7	68	56.7	34	59.6	
Martial status									2.13
Single, never married	140	70.0	16	66.7	82	67.2	42	77.8	
Currently or previously married	60	30.0	8	33.3	40	32.8	12	22.2	
Race									31.01**
Caucasian	135	66.8	22	91.7	91	75.2	22	38.6	
Other	67	33.2	2	8.3	30	24.8	35	61.4	
Education									6.4
Some college or less	102	50.5	10	41.6	57	46.3	35	63.6	
College graduate	57	28.2	7	29.2	40	32.5	10	18.2	
Postgraduate	43	21.3	7	29.2	26	21.1	10	18.2	
Age									F 0.17
Mean	33.32		32.42		33.26		33.84		
SD	10.02		9.73		10.35		9.55		
Range	19–65		20–46		19–65		20–61		

Note. Variations in sample size are the result of missing data. Percentages may not sum to 100% due to errors in rounding. *$p<.05$; **$p<.01$.

internal consistency ($\alpha = .92$), comparable to the internal consistency reported for Telch et al.'s (2004) nonclinical sample ($\alpha = .94$).

CONFIRMATORY FACTOR ANALYSIS

A confirmatory factor analysis was conducted to assess the fit of the three-factor structure obtained by Telch et al. (2004) to the ASC responses of individuals with social anxiety disorder (with the use of AMOS 5, a structural equation modeling software program; Arbuckle, 2002). Correlations

between the latent variables in the model were allowed, and a maximum likelihood method of covariance analysis was utilized. Several indices suggest a poor match of the data to the original structure, as they failed to meet proposed cutoff scores of adequate fit (Hu & Bentler, 1999). Examined fit indices included the chi-square test of covariance equivalence, $\chi^2(168) = 614.96$, $p < .01$; the Tucker Lewis Index (TLI; Tucker and Lewis, 1973) = 0.72; the Comparative Fit Index (CFI; Bentler, 1990) = 0.77; and the root mean

Table 2
Severity scores of the total sample and patients from the three collaborative sites

	Total sample (N=204)		Albany (n=24)		Philadelphia (n=123)		New York (n=57)		F
	M	SD	M	SD	M	SD	M	SD	
Appraisal of Social Concerns	52.96	20.15	52.52	19.63	51.53	19.02	56.05	22.48	0.99
ASC Subscale 1	59.34	22.96	58.68	23.51	58.62	21.50	61.17	25.92	0.25
ASC Subscale 2	40.13	22.10	38.89	18.51	37.71	22.12	45.88	22.74	2.75
Brief Fear of Negative Evaluation Scale [a]	30.01	7.05	30.73	7.25	30.21	6.61	29.30	7.93	0.44
Social Phobia Scale	31.10	15.94	32.67	11.72	29.77	15.81	33.34	17.62	1.10
Social Interaction Anxiety Scale	49.23	15.21	50.08	12.23	48.64	15.94	50.16	14.88	0.23
Beck Depression Inventory	12.87	8.62	10.04	5.41	13.01	8.96	13.76	8.85	2.09 [b]
Anxiety Sensitivity Index–Full Scale	24.89	12.73	26.17	10.39	23.71	12.65	26.93	16.66	1.38
ASI–Physical Concerns	11.43	6.74	11.46	6.12	10.97	6.90	12.45	6.64	0.925
ASI–Mental Incapacitation Concerns	5.19	3.99	6.42	3.74	4.72	3.92	5.71	4.13	2.53
ASI–Social Concerns	9.68	3.52	10.29	2.68	9.42	3.48	9.98	3.91	0.915

No differences significant at $p<.05$.
[a] BFNE scores calculated on the 8 straightforwardly-worded items only.
[b] Brown Forsyth F^* tests conducted to account for heterogeneity of variances (as measured by Levene's test) among collaborative sites.

square error of approximation (RMSEA) = 0.12, 90% CI = 0.11, 0.13. The assumption of multi-variate normality was not satisfied, however. Hu, Bentler, and Kano (1992) suggest that the violation of this assumption may bias tests of fit in a confirmatory factor analysis, such that too many models are rejected. Dropping the items that were not univariate normal did not produce multivariate normality. To satisfy the condition of multivariate normality, the items on each of Telch et al.'s three factors were randomly paired and summed, with the following constraints: (a) items that were not univariate normal (e.g., skewness greater than 1.0) were added to items that were univariate normal; (b) factors with odd numbers of items were left with one item that was not paired with another (two items total; for a discussion of the appropriateness of this technique see Gorsuch, 1997; West, Finch, & Curran, 1995). This process of pairing items yielded multivariate normality in the sample. Subsequently, a second confirmatory factor analysis was conducted on the summed, multivariate normal scores and fit indices were again examined, which further confirmed a poor fit of the proposed factor structure to the clinical sample, $\chi^2(42) = 261.28$, $p < .01$; TLI = 0.77; CFI = 0.83; RMSEA = 0.17, 90% CI = 0.15, 0.19. Thus, the poor fit of the model is unlikely to be due to lack of multivariate normality alone.

EXPLORATORY FACTOR ANALYSIS

Given the poor fit of the Telch et al. (2004) factor structure to the current sample, an exploratory factor analysis was conducted. A principal components analysis with an oblique promax rotation[2] (as recommended by Gorsuch, 1997; Floyd & Wida-man, 1995) was utilized to examine the structure of the ASC's 20 items. A scree plot of eigenvalues (Cattell, 1966) was examined, and a two-factor solution was deemed most appropriate. As suggested by Floyd and Widaman (1995), a maximum likelihood factor analysis was then conducted to examine the relationships of observed variables to latent variables. Items with factor loadings greater than 0.40 were retained, and any item with less than a 0.10 difference in loadings between the factors was rejected. Thus, 19 items were retained and 1 item, "Concerns about blushing," was rejected. Promax rotated factor loadings are pre-

[2] A principal components analysis with an oblique promax rotation was pursued because the factors were presumed to be correlated in nature and because we wished to follow the original procedures of Telch et al. (2004) as closely as possible. Following reviewer comment, a principal components analysis with varimax orthogonal rotation was also conducted and yielded similar results. Specific details of these analyses are available from the authors.

Table 3

Rotated factor loadings for common factor analysis of the Appraisal of Social Concerns (ASC)

Item	Subscale 1	Subscale 2
Subscale 1: *Concerns With Negative Evaluation and Rejection*		
Concerns about appearing stupid (ASC 2)	0.696	0.111
Concerns about people laughing at you (ASC 3)	0.786	0.003
Concerns about people ignoring you (ASC 5)	0.657	−0.074
Concerns about people staring at you (ASC 6)	0.450	0.310
Concerns about appearing incompetent (ASC 9)	0.743	0.077
Concerns about being incoherent (not making sense) (ASC 10)	0.534	0.025
Concerns about not performing adequately (ASC 12)	0.499	0.265
Concerns about appearing weird (ASC 14)	0.584	0.189
Concerns about people ridiculing you (ASC 15)	0.839	0.000
Concerns about not being able to think (mind going blank) (ASC 16)	0.453	0.283
Concerns about appearing ugly (ASC 17)	0.757	−0.243
Concerns about appearing weak (ASC 18)	0.494	0.121
Concerns about people rejecting you (ASC 19)	0.980	−0.295
Subscale 2: *Concerns With Physical Symptoms*		
Concerns about trembling (ASC 1)	−0.274	0.869
Concerns about twitching (ASC 7)	−0.120	0.675
Concerns about voice quality (cracking, stuttering, squeaking, etc.) (ASC 8)	0.254	0.460
Concerns about losing control (screaming, running out, etc.) (ASC 11)	0.022	0.509
Concerns about being tense (ASC 13)	0.097	0.494
Concerns about sweating (ASC 20)	0.013	0.510
Rejected Item		
Concerns about blushing (ASC 4)	0.161	0.394

sented in Table 3. Subscale scores were calculated by averaging the individual scores of items loading on each factor.

Both subscales evidenced a normal distribution (Subscale 1: skewness = −0.458, kurtosis = −0.320; Subscale 2: skewness = 0.464, kurtosis = −0.401). Subscale 1's mean score was 59.34 (SD = 22.96), and its internal consistency was excellent (α = .92). Subscale 2's mean score was 40.13 (SD = 22.10), and it demonstrated strong internal consistency as well (α = .76). Subscales 1 and 2 demonstrated a correlation of .52 (p < .001).

Subscale 1 was labeled Concerns With Negative Evaluation and Rejection because the items loading on this factor assess an individual's concern with

negative social outcomes, such as appearing inadequate, performing poorly, and being judged or rejected. Subscale 1 consisted of 13 items and accounted for 40.78% of the variance. With the exception of "Concerns about not being able to think (mind going blank)" and "Concerns about appearing incoherent (not making sense)," all items loading on Subscale 1 represent a combination of Telch et al.'s (2004) factors labeled Concerns With Negative Evaluation and Concerns With Social Helplessness (p. 221). Subscale 2 was labeled Concerns With Physical Symptoms, as the items loading on the factor assess an individual's concern about experiencing physical symptoms, such as trembling and twitching. Subscale 2 consisted of 6 items and accounted for 10.44% of the variance. All items but "Concerns about losing control (screaming, running out, etc.)" from Subscale 2 loaded on Telch el al.'s Observable Symptoms Scale (p. 221). Thus given the similarity between Telch et al.'s factors and those of the present study, coefficients of congruence (Gorsuch, 1983) were calculated (see Table 4). Telch et al.'s Negative Evaluation subscale and Subscale 1 of the present study were strongly related (coefficient of congruence = .90). Similarly, Telch et al.'s Observable Symptoms subscale was strongly related to Subscale 2 in the present study (coefficient of congruence = .90). Therefore, despite the poor fit of the current study's clinical data to Telch et al.'s factor structure in the confirmatory factor analysis, the factors appear to be quite similar.

CONVERGENT VALIDITY OF THE ASC

A Bonferroni correction was applied to control for the number of comparisons between the ASC (and each of its subscales) and the four measures of social anxiety (.05/4 = .0125). The ASC total score was significantly correlated with all measures of

Table 4
Coefficients of congruence between Appraisal of Social Concerns factors from the present study and Telch et al. (2004)

Telch et al.	Present study	
	I	II
I	.90	.26
II	.15	.90
III	.45	.15

Note. Coefficients of congruence (Gorsuch, 1983) were derived using factor loadings from factor pattern matrices. Factor labels assigned by Telch et al. (2004): Factor I, Concerns With Negative Evaluation; Factor II, Concerns With Observable Physical Symptoms; Factor III, Concerns With Social Helplessness. Factor labels assigned in the present study: Factor I, Concerns With Negative Evaluation and Rejection; Factor II, Concern With Physical Symptoms.

Table 5
Zero-order correlations of the Appraisal of Social Concerns (ASC) and its factors with measures of social anxiety

	ASC	Subscale 1	Subscale 2
Brief Fear of Negative Evaluation Scale	.591*	.665*	.236*
Social Interaction Anxiety Scale	.444*	.522*	.122
Social Phobia Scale	.594*	.524*	.513*
Anxiety Sensitivity Index–Social Concerns	.451*	.283*	.650*

*Note. N*s vary from 198 to 204. Bonferroni correction based on the number of comparisons per column. BFNE scores calculated on straightforward-worded items only. *$p < .0125$ (.05/4).

social anxiety. Subscale 1, reflecting concerns with negative evaluation and rejection, was also significantly correlated with all measures of social anxiety. Subscale 2, reflecting concerns with physical symptoms, was significantly correlated only with the BFNE, the SPS, and the Social Concerns subscale of the ASI (see Table 5).

In both the Telch et al. (2004) study and the current study, the ASC was found to measure different facets of social concerns (e.g., concern with negative evaluation and with physical anxiety symptoms). Therefore, it was expected that the ASC's subscales would demonstrate measurement specificity and each would correlate more strongly with questionnaires that measure presumably similar constructs. Therefore, tests of correlated correlation coefficients, as described by Meng, Rosenthal, and Rubin (1992), were conducted to determine if the ASC and its subscales were related more strongly to specific convergent measures than to others. A Bonferroni correction was applied to control the error rate in multiple comparisons of the ASC's (and each of its subscales') correlations with the four measures used to assess convergent validity in this study (.05/4 = .0125). The ASC's total score was highly correlated with all convergent measures; however, its correlation with the BFNE was significantly stronger than its correlation with the SIAS, $z = 2.90$, $p = .004$, and its correlation with the SPS was stronger than its correlations with both the SIAS and the Social Concerns subscale of the ASI, $z = 2.62$, $p = .009$; $z = 2.64$, $p = .008$.

Subscale 1 was more highly correlated with the BFNE than with either the SIAS or the SPS, $z = 3.17$, $p < .001$; $z = 2.70$, $p = .007$. Subscale 1's correlations with the BFNE, SPS, and SIAS were all stronger than its correlation with the Social Concerns subscale of the ASI, $z = 5.60$, $p < .001$; $z = 4.24$, $p < .001$; $z = 3.25$, $p = .001$, respectively.

Subscale 2 demonstrated a stronger correlation with the SPS than with the SIAS, $z = 6.07$, $p < .001$, or the BFNE, $z = 4.91$, $p < .001$. Also, Subscale 2's

correlation with the ASI's Social Concerns subscale was stronger than its correlations with the SIAS and BFNE, $z = 6.48$, $p < .001$; $z = 5.80$, $p < .001$, but not stronger than Subscale 2's correlation with the SPS, $z = 2.31$, *ns*. Further, Subscale 1 demonstrated significantly stronger correlations than Subscale 2 with the BFNE, $z = 7.24$, $p < .001$, and the SIAS, $z = 5.95$, $p < .001$, but not the SPS, $z = -0.14$, *ns* (all comparisons Bonferroni corrected; .05/4 = .0125). Lastly, Subscale 2 demonstrated a stronger linear relationship with the Social Concerns subscale of the ASI than did Subscale 1, $z = 6.29$, $p < .001$.

DISCRIMINANT VALIDITY OF THE ASC
A Bonferroni correction was applied to control the error rate in multiple comparisons of the ASC's (and each of its subscales') correlations with the measures used to evaluate discriminant validity in this study (.05/2 = .025). The ASC total score, Subscale 1, and Subscale 2 were all positively correlated with these measures (see Table 6).

Tests of correlated correlation coefficients were again conducted to determine whether the ASC's linear relationships and those of its subscales were stronger with measures of social anxiety than with the discriminant measures. A Bonferroni correction was applied to the comparisons of each ASC score's correlation with convergent and discriminant measures (.05/8 = .0063). The ASC total score was more strongly related to the BFNE and the SPS than it was to the nonsocial (Mental Incapacitation and Physical Concerns) subscales of the ASI, $z = 2.99$, $p = .003$; $z = 3.86$, $p < .001$, and the BDI, $z = 2.96$, $p = .003$; $z = 2.92$, $p = .003$. Other comparisons were nonsignificant. There were also significant differences between Subscale 1's correlations with the BFNE and its correlations with the nonsocial subscales of the ASI, $z = 5.33$, $p < .001$, and BDI, $z = 4.12$, $p < .001$. Further, Subscale 1's correlations with the SIAS and SPS were significantly stronger than its correlation with the nonsocial subscales of the ASI, $z = 3.10$, $p = .002$; $z = 3.91$, $p < .001$.

Table 6
Zero-order correlations of the Appraisal of Social Concerns (ASC) and its factors with discriminant validity measures

	ASC	Subscale 1	Subscale 2
Anxiety Sensitivity Index–Physical and mental incapacitation concerns	.352*	.252*	.473*
Beck Depression Inventory	.404*	.419*	.231*

Note. *N*s vary from 199 to 204. Bonferroni correction based on the number of comparisons per column. *$p < .025$ (.05/2).

Subscale 2 evidenced a significantly stronger correlation with the ASI Social Concerns subscale than with the ASI's nonsocial subscales, $z = 4.18$, $p < .001$. Also, Subscale 2's correlations with the SPS and the Social Concerns subscale of the ASI were significantly stronger that its correlation with the BDI, $z = 4.01$, $p < .001$; $z = 5.77$, $p < .001$. Finally, Subscale 2 demonstrated stronger relationships with the nonsocial subscales of the ASI than with the BFNE, $z = 3.01$, $p < .001$, or the SIAS, $z = 3.87$, $p < .001$, but not the SPS, $z = 0.92$, *ns*.

SENSITIVITY TO TREATMENT
Within-group effect sizes (*d*; Cohen, 1988) were calculated for participants treated with CGBT ($n = 43$), phenelzine sulfate ($n = 25$), and pill placebo ($n = 18$). The ASC total score demonstrated effect sizes of 0.99, 1.10, and 0.89 for CBGT, phenelzine, and placebo, respectively. For Subscale 1, effect sizes for the three conditions of 0.90, 1.20, and .82 were obtained. For Subscale 2, effect sizes of 0.70, .94, and .67 were obtained. Subscale 2's effect sizes for the CBGT and placebo conditions were the only ones to fall below Cohen's suggested cutoff for a large effect size (0.80), as they were in the medium effect size range. It should be noted that these are uncontrolled effect sizes, which are less conservative than controlled effect sizes.

Discussion
The present study is the first to examine the psychometric properties of the ASC in a large sample of patients with clinical social anxiety disorder. Data analyses were conducted to examine the nature of the ASC's factor structure, reliability, convergent and discriminant validity, and sensitivity to treatment effects. Initially, a confirmatory factor analysis was conducted, which revealed a poor fit with the three-factor structure derived by Telch et al. (2004) in a nonclinical sample. Also, when items were combined to achieve multivariate normality, a second confirmatory factor analysis yielded a poor fit with Telch et al.'s model. Thereafter, an exploratory factor analysis was conducted, which indicated a two-factor solution. Factor 1 was labeled Concerns With Negative Evaluation and Rejection and Factor 2 was labeled Concerns With Physical Symptoms. This two-factor solution retained 19 of the ASC's 20 items, with only "Concerns about blushing" falling just below the established factor-loading cutoff of 0.40. The ASC demonstrated excellent internal consistency, comparable to that observed in Telch et al.'s (2004) nonclinical sample. In terms of convergent validity, the ASC's total score and Subscale 1's score were

significantly correlated with all measures of social anxiety while Subscale 2's score was significantly correlated with three of the four measures of social anxiety. All ASC scores were significantly correlated with the measures employed to assess discriminant validity, but generally less strongly than with the measures of social anxiety. Lastly, the ASC demonstrated sensitivity to the treatment of social anxiety disorder with CBGT and phenelzine sulfate. The ASC also demonstrated sensitivity to placebo effects.

Although confirmatory factor analysis revealed that the responses of our clinical sample did not fit well with Telch et al.'s (2004) three-factor model, an exploratory factor analysis did reveal a fairly similar structure. The content of Telch et al.'s first and second factors (concerns about Negative Evaluation and Observable Symptoms, respectively) was evident in our two-factor solution. In the present study, Subscale 1 retained all of the items from Telch et al.'s first subscale, and added items 10 ("Being incoherent [not making sense]"), 16 ("Not being able to think [mind going blank]"), 5 ("People ignoring you"), and 18 ("Appearing weak"). Items 10 and 16 had loaded on Telch et al.'s Observable Symptoms factor while Items 5 and 18 loaded onto their factor of concerns with Social Helplessness. These items appear to address concerns with social evaluation (especially regarding social incompetence) as well as rejection; thus, a factor label similar to that chosen by Telch et al. was applied. All items loading onto Subscale 2 also loaded onto Telch et al.'s Observable Symptoms factor, with the exception of Item 11 ("Losing control [screaming, running out]"), which loaded onto their Social Helplessness factor. Furthermore, coefficients of congruence (Gorsuch, 1983) confirmed the similarity between the subscales in Telch et al. (2004) and those in the present study. Subscale 2 was labeled Concerns With Physical Symptoms as the items assess respondents' preoccupation with experiencing these symptoms in an anxiety-inducing situation. Such labeling diverges slightly from that of Telch et al., as respondents were not able to express explicitly whether they were concerned with the experience of the physical symptoms or if they were concerned with those symptoms being observable to others (although given the nature of the sample and Subscale 2's correlation with the SPS and the ASI Social Concerns subscale, both are likely to be true).

The ASC generally demonstrated strong reliability and validity in the present clinical sample. The internal consistency of the total score was excellent, and the alpha coefficient was nearly identical to that reported by Telch et al. for their nonclinical sample.

The ASC also evidenced strong convergent validity, as it was significantly correlated with all social anxiety measures utilized in the study.

The ASC's total score demonstrated a particularly strong relationship with the BFNE and the SPS, as correlations with both were greater than those found with the SIAS. Also, Subscale 1 demonstrated a particularly strong relationship with the BFNE, as correlations were stronger than those with the SIAS, the SPS, and the Social Concerns subscale of the ASI, underscoring this subscale's assessment of concerns with negative evaluation. Subscale 2 evidenced a significantly larger correlation with the SPS and the ASI's Social Concerns subscale than with the BFNE and the SIAS. Therefore, Subscale 2 appears to be strongly related to the respondents' fear of being observed in social contexts, but not as strongly related to other aspects of social anxiety. However, Subscale 2's relationship with the ASI's Social Concerns factor may be the most interesting. This correlation was stronger than Subscale 2's relationships with the BFNE and the SIAS, as well as Subscale 2's correlations with the ASI's nonsocial subscales; however, it was not significantly greater than the correlation with the SPS, which, as discussed above, was quite strong. It is logical that Subscale 2 would be highly correlated with the ASI's Social Concerns subscale, as the items loading onto the ASC factor appear to assess concerns with the physical symptoms one experiences in anxiety-provoking situations, specifically as the respondent pictures himself/herself in a difficult social situation (Reiss and McNally, 1985). E. Brown et al. found that the fear of anxiety-related physical symptoms (as measured by the ASI) and the fear of being the object of social observation (as measured by the SPS) were highly correlated, whereas scores on the SIAS were more closely related to scores on the Penn State Worry Questionnaire (Meyer et al., 1990).

Analyses of discriminant validity revealed that all ASC scores were significantly correlated to the ASI's nonsocial subscales and the BDI. However, the ASC's correlation with the BFNE and SPS were larger than its correlations with the BDI and the ASI's nonsocial subscales. Also, Subscale 1's correlation with the BFNE was stronger than its correlations with the ASI nonsocial subscales and the BDI. Subscale 1's correlations with the SIAS and SPS were only stronger than its correlation with the ASI's nonsocial subscales. Subscale 2's correlation with the SPS was stronger that its correlation with the BDI. It appears that the ASC has demonstrated adequate discriminant validity in the present study; however, it should be noted that its correlations

with divergent measures were quite high on a number of occasions, at times comparable in strength to the ASC's correlations with convergent measures. Therefore, not all of the ASC's correlations with convergent measures were significantly stronger. This is likely because the constructs tapped by the discriminant measures (i.e., sensitivity to bodily sensations (Scott et al., 2000) and symptoms of depression (Kessler, Chiu, et al., 2005)) are experienced by many patients with social anxiety disorder. Given that the discriminant measures tap these constructs, it is not surprising that the ASC was sometimes strongly related to them.

The effect sizes demonstrated by CBGT in this study were comparable to those previously reported by Telch et al. (2004). However, in this study, we also examined the sensitivity of the ASC to phenelzine and placebo. The full-scale ASC score and Subscale 1 evidenced large pre- to posttreatment effect sizes for all three conditions, as did Subscale 2 in the phenelzine condition. Phenelzine was associated with somewhat larger effect sizes than CBGT after 12 weeks of treatment, consistent with previous research showing greater short-term change on self-report measures in response to phenelzine than CBT (Heimberg et al., 1998). It is possible that phenelzine effectively limited the experience of physical symptoms of anxiety and thus resulted in fewer concerns about the experience of these symptoms (and pursuant negative evaluation) in typically difficult social situations. Nevertheless, both treatments were at least moderately effective in reducing socially relevant threat appraisals. Although this may be expected for both CBGT and phenelzine, there is a growing literature suggesting that social anxiety–related concerns are also sensitive to placebo effects (Huppert et al., 2004).

In the present clinical sample, the ASC appears to be bifactorial, with two factors conceptually similar to those found by Telch et al. (2004). Factor 1 is related to a range of social anxiety, particularly fear of negative evaluation. Factor 2 is related to the fear of being observed by others and to the interpretation of bodily sensations as catastrophic, specifically the social implications of such catastrophe. Furthermore, the fear of social catastrophe related to bodily sensations is more strongly related to Factor 2 than are fears of physical and mental catastrophes associated with bodily sensations. Such a factor structure may afford the ASC a certain degree of clinical utility. Telch et al. suggested that the ASC might be utilized in treatment planning, as a clinician may be able to target the idiosyncratic concerns of individual respondents. Indeed, the subscales themselves allow for an examination of particular areas of concern, and their relationships to other indices of social anxiety (e.g., social interaction, social performance) may indicate specific details to be considered in the construction of exposure exercises. For instance, patients with particularly elevated scores on Subscale 1 may benefit most from social interaction–focused exposures. Similarly, Subscale 2 may serve as a useful index of a patient's self-perception in social situations, which may indicate the appropriateness of video feedback exercises (e.g., Harvey, Clark, Ehlers, & Rapee, 2000) for particular patients.

The present study is limited in several ways. First, individuals with severe comorbid diagnoses, such as bipolar disorder or schizophrenia, were excluded; thus, the results may not be generalizable to patients with more complex presentations of social anxiety. This sample was also very well-functioning in that nearly half (49.5%) had earned at least a college degree. The examination of a robust chi-square statistic would demonstrate more clearly that the poor fit of Telch et al.'s (2004) proposed factor structure was not related to multivariate nonnormality in the present sample; however, this test statistic was unavailable. Also, test-retest reliability was not examined in the current sample, as the ASC was only given at one time point before the start of therapy. Additionally, the measures used to examine discriminant validity (the Beck Depression Inventory and nonsocial subscales of the Anxiety Sensitivity Index) may be related to the construct underlying the target measure. Thus, a firm conclusion of the ASC's discriminant validity awaits future research. However, given this limitation, it should be noted that the separation between the ASC's convergent and discriminant correlations were in expected directions, demonstrating a considerable degree of validity of the ASC and its subscales. In an examination of the ASC's treatment sensitivity, only data from those participants who entered and completed treatment with CBGT, phenelzine sulfate, and pill placebo were analyzed. This decision was made for better comparison to the data of Telch et al. (2004), but future studies might also include intent-to-treat analyses.

The sample was only moderately diverse, as 66.8% of participants were Caucasian, while the remaining 33.2% were comprised of people who identified with all other ethnicities. ASC scores were significantly influenced by ethnicity, as Caucasians reported lesser social concerns. Interestingly, this difference appears to be related specifically to social

threat appraisal rather than the experience of social anxiety per se. Nevertheless, there is a small literature highlighting the differences between people of different ethnicities on self-report measures of social anxiety (Fresco et al., 2001; Okazaki, Liu, Longworth, & Minn, 2002). It is clear that further research is necessary to examine ethnic differences in threat appraisal and how respondents report them. Additional directions for future research include the replication of the present factor structure with an additional sample of patients with social anxiety disorder. In the present study, most clients endorsed a sufficient number of symptoms to meet the criteria of the generalized subtype. Thus the ASC should also be examined in patients with both generalized and nongeneralized subtypes of social anxiety disorder. The ASC should also be examined in samples with comorbid disorders more severe than those included in the present study; such exploration would help establish the ASC's discriminant utility regarding social anxiety as well as the generalizability of our findings to more severely disordered populations. Lastly, the discriminant validity of the ASC should also be confirmed with measures that are less related to social threat appraisals than the measures used in the present study.

In conclusion, our examination of the ASC with a large clinical sample of patients with social anxiety disorder has shown it to have considerable psychometric strengths. Although the factor structure derived here is different from that in the scale development sample, it is conceptually similar. The ASC is a relatively new measure requiring further exploration with more diverse clinical samples; however, after initial investigation, it appears to be a valid and reliable measure of concerns about negative evaluation and physical anxiety symptoms in patients with social anxiety disorder.

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