Relations of the factors of the tripartite model of anxiety and depression to types of social anxiety

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Abstract

Our primary goal was to examine the relations of the specific components of the tripartite model of anxiety and depression [Clark, L. A., Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology*, *100*, 316–336] to two types of social anxiety (social interaction anxiety and performance anxiety) in 148 individuals with social phobia. In line with previous research, overall social anxiety was more closely related to the anhedonic depression (AD) or low positive affect factor of the tripartite model than to the physiological hyerarousal factor, controlling for general distress. However, as hypothesized, performance anxiety was more closely associated with the physiological hyerarousal factor, whereas social interaction anxiety was more closely associated with the AD or low positive affect factor. We also examined the convergent and discriminant validity of the Mood and Anxiety Symptom Questionnaire (MASQ; [Watson, D., Clark, L. A. (1991). The mood and anxiety symptom questionnaire. Unpublished manuscript, University of Iowa City]). Intercorrelations of the MASQ subscales were as expected, but correlations with measures of social anxiety, nonsocial anxiety, and depression provided only modest support for convergent and discriminant validity. Findings from this study provide a more detailed account of the specific components of the tripartite model that characterize the diversity of symptoms subsumed by social phobia.
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Introduction

Over the past two decades, structural models of anxiety and depression have emerged to explicate the shared and unique features of these highly related and commonly comorbid conditions (Mineka, Watson, & Clark, 1998). Of these models, Clark and Watson's (1991) tripartite model of anxiety and depression has received the greatest amount of empirical attention (e.g., Brown, Chorpita, & Barlow, 1998; Chorpita, Plummer, & Moffitt, 2000; Clark, Steer, & Beck, 1994; Joiner, 1996; Joiner, Cantanzaro, & Laurent, 1996; Steer, Clark, Beck, & Ranieri, 1995;

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Watson, Clark, Weber, Assenheimer, Strauss, & McCormick, 1995; Watson, Weber, Assenheimer, Clark, Strauss, & McCormick, 1995). The tripartite model posits a general distress or negative affect factor that is shared by both anxiety and depression, a physiological hyperarousal factor that is relatively unique to anxiety, and an anhedonia or low positive affect factor that is relatively unique to depression.

Several studies provide empirical support for the structure of the tripartite model using adult and child clinical outpatient samples (e.g., Clark, Watson, & Mineka, 1994; Joiner et al., 1996; Steer et al., 1995). For example, Steer et al. factor analyzed responses to the Beck Anxiety Inventory (BAI; Beck & Steer, 1993a) and the Beck Depression Inventory (BDI; Beck & Steer, 1993b) from a large outpatient sample. Consistent with the tripartite model, they found a general distress factor that accounted for the majority of the explained variance common to both these measures, as well as a specific anxiety factor defined primarily by BAI physiological items, and items from the BDI that were markers of a low positive affect/anhedonia factor.

Although there is support for the tripartite model in college and outpatient samples, studies with children and adults with primary anxiety and mood disorders have reported deviations with regard to the relation of specific tripartite factors to specific anxiety disorders (e.g., Brown et al., 1998; Chorpita et al., 2000). For example, research suggests that physiological arousal may not be a specific component of all of the anxiety disorders but rather a specific characteristic of panic disorder (Brown et al., 1998). Furthermore, contrary to predictions of the tripartite model, low positive affect appears to be related to social phobia as well as depression (Brown et al., 1998; Chorpita et al., 2000; Watson, Clark, & Carey, 1988). The latter finding may stem from the fact that persons with high positive affect are characterized by interpersonal engagement (Clark & Watson, 1988), which is typically impaired in both depressed and socially anxious individuals (Clark et al., 1994; Watson et al., 1988).

Given these discrepant findings and the marked heterogeneity of the anxiety disorders, Mineka et al. (1998) proposed a reformulated version of the tripartite model, which they labeled the integrative hierarchical model of anxiety and depression. This reformulated model is an attempt to provide a more comprehensive structural account of the diversity of symptoms subsumed by the anxiety disorders by integrating the original tripartite model with Barlow and colleagues' hierarchical model of the anxiety disorders (Brown et al., 1998; Zinbarg & Barlow, 1996). Barlow and colleagues' hierarchical model posits that each of the anxiety disorders has a specific component that differentiates it from the others and a higher-order shared component characterized as negative affect.

Although findings from Brown et al. (1998) suggest that, of the anxiety disorders, low positive affect or anhedonia is specifically related to social phobia, there are at least two distinct types of social anxiety experienced by individuals with social phobia: social interaction anxiety and performance anxiety. Social interaction anxiety consists of fear of interacting with others (e.g., initiating and maintaining conversations with people in dyads or groups) whereas performance anxiety consists of fear of doing an activity in front of others that typically would not be feared if done alone (e.g., writing, playing an instrument, public speaking). Factor analytic studies support the distinction between these two types of social anxiety (e.g., Habke, Hewitt, Norton, & Asmundson, 1997; Safren, Turk, & Heimberg, 1998; Safren et al., 1999). Because high levels of positive affect are associated with social activity and interpersonal engagement (Clark & Watson, 1988; Clark et al., 1994; Watson et al., 1988), anhedonia/low positive affect may be related to social interaction anxiety (and not performance anxiety). Conversely, although research suggests that the physiological hyerarousal factor may be specific to panic disorder rather than a more general characteristic of the anxiety disorders, performance anxiety has been linked to panic symptoms in past research (e.g., Brown et al., 1997; Norton, Cox, Hewitt, & McLeod, 1997). Therefore, the physiological hyperarousal factor of the tripartite model may be more strongly related to the performance anxiety experienced by individuals with social phobia.

The primary aim of this study was to examine the relationships between specific components of the tripartite model and the two types of social anxiety typically experienced by individuals with social phobia. We hypothesized that social interaction anxiety would be more strongly related to the anhedonia/low positive affect factor than to the physiological hyperarousal factor of the tripartite model and that the converse would be true for performance anxiety.

A secondary aim of this study was to examine the convergent and discriminant validity of the MASQ in a clinical population different than that examined by Watson, Weber et al. (1995). As noted by Watson, Weber et al. (1995), the individuals in their clinical sample (predominately male individuals seeking treatment for

substance use disorders) were less than optimal given that they did not report clinical levels of anxiety and because diagnostic information regarding anxiety and mood disorders was not available. Thus, Watson and colleagues suggested that the results of their study needed to be replicated with samples of individuals with clinical levels of anxiety and depression. To date, no study has done that. Therefore, the current study examined the convergent and discriminant validity of the MASQ in a sample of adults with social phobia.

Method

Participants

The sample consisted of 148 individuals with a principal *DSM-IV* (American Psychiatric Association, 1994) diagnosis of social phobia who sought treatment at one of three sites: (1) the Adult Anxiety Clinic of Temple University, Philadelphia, PA ($n = 69$), (2) the Anxiety Disorders Clinic at the New York State Psychiatric Institute ($n = 56$), or (3) the Center for Stress and Anxiety at the University at Albany, SUNY ($n = 23$). The Anxiety Disorders Interview Schedule for *DSM-IV*, Lifetime Version (ADIS-IV-L; DiNardo, Brown, & Barlow, 1994) was used for diagnostic assessments at the Philadelphia and Albany sites. The ADIS-IV-L has demonstrated excellent reliability ($k = .77$) for a principal diagnosis of social phobia in a previously reported sample (Brown, DiNardo, Lehman, & Campbell, 2001). Diagnostic interviewers for the current study were trained and certified according to the procedures outlined by the developers of the ADIS-IV-L. This included review of the training manual and successful completion of a series of diagnostic interviews. Trainees first observed a series of interviews conducted by a senior diagnostician and then conducted interviews while being observed. In order to become certified to conduct interviews independently, the trainee needed to match the senior interviewer on three consecutive interviews regarding the principal diagnosis and presence of all additional current and lifetime diagnoses. Reliability data available for 80 clients in the current sample showed 100% agreement between the ADIS interviewer and an independent assessor on the diagnosis of social phobia. Scores on the Clinician's Severity Rating, which assesses the severity of social anxiety symptoms and the degree of associated impairment were significantly correlated ($r = .61$), with 100% agreement within one rating point (range from 0 to 8). The Structured Clinical Interview for *DSM-IV* (SCID-IV; First, Spitzer, Gibbon, & Williams, 1996) was employed at the New York site. Training procedures similar to those described above for the ADIS-IV-L were utilized, but data regarding the inter-rater agreement of SCID-IV diagnoses are not available for this sample.

Participants were recruited through newspaper advertisements and local referrals for social anxiety treatment at each of the sites. Most took part in a clinical trial comparing cognitive-behavioral group therapy, pharmacotherapy and their combination for the treatment of social phobia. Potential participants were excluded from that trial if there was evidence of schizophrenia, current major depressive disorder (MDD), significant risk of self-harm, alcohol or substance abuse in the past 6 months, history of bipolar disorder, or an organic mental disorder. Participants at the Albany and Philadelphia sites who refused treatment in the clinical trial or who were excluded for medical reasons were offered open treatment with cognitive-behavioral group therapy. These individuals were assessed in the same manner as those who participated in the clinical trial and are included herein. However, individuals with an additional diagnosis of MDD were allowed to participate.[1] Demographic characteristics of the participants in the current study for each of the sites and the total sample are presented in Table 1.

Measures

Mood and Anxiety Symptom Questionnaire-Short Form (MASQ; Watson & Clark, 1991): The MASQ short form is a 62-item measure of mood and anxiety symptoms developed to test key predictions of the tripartite model. The MASQ has four subscales: (1) General Distress Anxious Symptoms (GDA: 11 items), (2)

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[1]Beck Depression Inventory scores did not significantly differ between the three sites, $F (2, 132) = 1.13$, $p = .33$. Twenty-six percent of the total sample had a secondary diagnosis of a current mood disorder (major depressive disorder, dysthymic disorder, or depressive disorder not otherwise specified).

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

	Philadelphia ($n = 69$)	New York ($n = 56$)	Albany ($n = 23$)	Total sample ($N = 148$)
Age				
Mean	32.00	33.39	31.05	32.41
Standard deviation	10.51	9.04	9.28	9.74
Gender				
% Female	43	41	33	41
% Male	57	59	67	59
Marital status				
% Single (never married)	82	79	75	80
% Ever married	18	21	25	20
Ethnicity				
% Caucasian	77	39	90	63
% African-American	15	25	5	18
% Other	8	36	5	19
Education level				
% Any high School	7	39	5	19
% Some college	40	26	35	34
% College graduate	34	18	25	26
% Graduate school	19	17	35	21

General Distress Depressive Symptoms (GDD: 12 items), (3) Anxious Arousal (AA: 17 items), and (4) Anhedonic Depression (AD: 22 items). The former two subscales contain items that do not tend to strongly differentiate the two syndromes and assess general distress symptoms commonly associated with anxiety (e.g., "Felt nervous"; "Muscles were tense or sore") and depression (e.g., "Felt discouraged"; Felt sluggish or tired"), respectively. The latter two subscales contain items hypothesized to be relatively unique to each of the syndromes. The MASQ-AA subscale consists of items that assess physiological hyperarousal or somatic symptoms thought to be relatively unique to anxiety disorders (e.g., "Was trembling or shaking"; "Hands were cold or sweaty"). The MASQ-AD subscale consists of eight items that assess anhedonia and loss of interest (e.g., "Felt like it took extra effort to get started"; "Felt like there wasn't anything interesting or fun to do") and 14 reverse-keyed items that assess positive emotional experiences (e.g., "Felt like I was having a lot of fun"; "Looked forward to things with enjoyment"). Respondents indicate the extent to which they experienced each symptom during the past week from 1 = not at all to 5 = extremely. The MASQ subscales have been found to have adequate convergent and discriminant validity as well as good internal consistency (Watson, Weber et al., 1995) in student and adult volunteer samples, as well as a clinical sample of patients receiving treatment for substance use disorders. However, the psychometric characteristics of the MASQ in other clinical populations have not been well documented. Alpha coefficients of .84, .93, .85, and .93 were obtained for the GDA, GDD, AA, and, AD subscales, respectively, in the current sample.

Social anxiety measures

Social Interaction Anxiety Scale (SIAS) *and Social Phobia Scale* (SPS) (Mattick & Clarke, 1998): The SIAS and SPS were designed to assess fear of interacting in dyads and groups (e.g., "When mixing socially, I am uncomfortable") and fear of performing activities in front of others (e.g., "I become anxious if I have to write in front of other people"), respectively (Mattick & Clarke, 1998). The SIAS and SPS are both comprised of 20 items.[2] Items on both measures are rated from 0 = not at all to 4 = extremely characteristic or true of me.

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[2] Two versions of the SIAS are currently available, one with 19 items, the other with 20 items. Responses to the 20-item version, which has been much more commonly used in published research, were used in the present study.

Both measures have demonstrated good reliability and validity, and have been shown to be sensitive to the effects of cognitive-behavioral and pharmacological treatment (e.g., Brown et al., 1997; Heimberg et al., 1998; Mattick & Clarke, 1998; Ries et al., 1998). Alpha coefficients of .92 and .91 were obtained for the SIAS and SPS, respectively, in the current sample.

Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987): The LSAS is a clinician-administered scale designed for the assessment of social phobia that also measures fear and avoidance of 11 social interaction situations (e.g., "Going to a party") and 13 performance situations (e.g., "Acting, performing, or giving a talk in front of an audience") resulting in four separate subscales: (1) Fear of Social Interaction, (2) Avoidance of Social Interaction, (3) Fear of Performance, and (4) Avoidance of Performance. Summing the four subscales yields an overall total social phobia score (LSAS-TS). Items are rated on separate 4-point scales of fear (0 = None; 3 = Severe) and avoidance (0 = Never; 3 = Usually). The Fear of Social Interaction (LSAS-FS), Fear of Performance (LSAS-FP) subscales and LSAS-TS were used in the current study because we were interested in examining the relationships of the two distinct types of social fears as well as overall social anxiety. Extensive evidence of good reliability, validity, and treatment sensitivity have been reported (e.g., Fresco et al., 2001; Heimberg et al., 1999; Mennin et al., 2002; Safren et al., 1999). Alpha coefficients of .79, .85, and .93 were obtained for LSAS-FP, LSAS-FS, and LSAS-TS, respectively, in the current sample.

Depression measures

BDI (Beck, Rush, Shaw, & Emery, 1979): The BDI assesses current depressive symptoms. It consists of 21 items, and the respondent chooses from a series of statements of increasing severity the one that best describes how he or she felt over the past week (e.g., "I do not feel sad", "I feel sad", "I feel sad all the time and can't snap out of it", "I am so sad or unhappy that I can't stand it"). The BDI has been demonstrated to be a reliable and well-validated measure of depressive symptoms (see Beck, Steer, & Garbin, 1988, for a review). Furthermore, the BDI has demonstrated good reliability and adequate convergent and discriminant validity among individuals with social phobia (Coles, Gibb, & Heimberg, 2001). The BDI was used in this study as the BDI-II (Beck, Steer, & Brown, 1996) was not available at the initiation of this project. An alpha coefficient of .88 was obtained in the current sample for the BDI total score.

Hamilton Rating Scale for Depression (HRSD; Hamilton, 1967): The HRSD as used in this study is a 21-item clinician-administered measure of depressive symptomatology (e.g., depressed mood, feelings of guilt, insomnia, somatic symptoms). Items on the HRSD consist of groups of graded statements reflecting increasing severity of symptoms of depression. The HRSD has been demonstrated to have adequate inter-rater reliability, validity, and treatment sensitivity (e.g., Bech, Allerup, Maier, & Albus, 1992).

Measures of nonsocial anxiety

Anxiety Sensitivity Index (ASI; Peterson & Reiss, 1992): The ASI is a widely used measure of fear of anxiety symptoms (e.g., "It scares me when I am nauseous", "Unusual bodily sensations scare me"). It consists of 16 items which are rated from 0 = very little to 4 = very much. The ASI has demonstrated adequate reliability and validity (Peterson & Kirsten, 1999). The construct of anxiety sensitivity as measured by the ASI has been shown to be most highly related to panic symptoms and to predict future panic attacks (e.g., Reiss, Peterson, Gursky, & McNally, 1986; Schmidt, Lerew, & Jackson, 1999; Taylor, Koch, & Crockett, 1991; Taylor, Koch, & McNally, 1992). Furthermore, individuals with social phobia who experience panic attacks in social situations report greater levels of anxiety sensitivity than those without panic attacks (Scott, Heimberg, & Jack, 2000). In the current sample, an alpha coefficient of .89 was obtained for the ASI total score.

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990): The PSWQ is a self-report assessment of the frequency, excessiveness, and uncontrollability of worry. It consists of 16 items scored from 1 = Not at all typical of me to 5 = Very typical of me. Examples of PSWQ items include "Many situations make me worry" and "I am always worrying about something." The PSWQ demonstrates good internal consistency in both clinical and undergraduate samples (all α's > .86) and excellent 1-month retest reliability in undergraduate samples ($r = .93$) (Brown, Antony, & Barlow, 1992; Meyer et al., 1990). Furthermore, patients with generalized anxiety disorder (GAD) obtain higher PSWQ scores than patients with

other anxiety disorders (including social phobia) and normal control participants (Brown et al., 1992). In the current sample, an alpha coefficient of .94 was obtained for the PSWQ total score.

Procedure

Individuals interested in receiving treatment for social phobia at each of the three sites were scheduled for a diagnostic interview. At this visit, informed consent was obtained. Individuals meeting inclusion criteria were offered participation in an outcome study comparing cognitive-behavioral group treatment (CBGT), the monoamine oxidase inhibitor phenelzine, CBGT plus phenelzine, and pill placebo. Those who refused study participation or met medical or psychiatric exclusion criteria at either the Philadelphia or Albany sites were offered open treatment using CBGT and were assessed in the same manner as those who participated in the treatment study. Assessment included questionnaires and an interview with an independent assessor, who administered the HRSD and LSAS and re-administered the social phobia module of the ADIS-IV-L. Data utilized in the present study were drawn from patients' pre-treatment assessments.

Results

Preliminary analyses

Preliminary analyses were conducted to examine if there were any significant differences across the three sites (see Table 1). No significant site differences were revealed in terms of age (F (2, 133) = .52, p = .60), gender (χ^2 (2, N = 135) = .50, p = .78), or marital status (χ^2 (2, N = 135) = .53, p = .77). Site differences were found for ethnicity (χ^2 (4, N = 137) = 27.05, $p < .0001$) and education level (χ^2 (6, N = 136) = 25.16, $p < .0001$). Specifically, the Philadelphia and Albany sites had a greater proportion of Caucasian participants than the New York site, and the New York site had a greater proportion of ethnic minorities. Furthermore, the Philadelphia and Albany sites had a greater proportion of participants with at least some college education, whereas the New York site had a greater proportion of participants with only a high school education. However, there were no site differences on the MASQ subscales (F's < 1, ps > .49). There were no significant differences on the MASQ subscales as a function of age, gender, ethnicity, or education level. Single patients had significantly higher scores on MASQ-AD (M = 68.86; SD = 15.05) than married patients (M = 62.33; SD = 12.74; F (1,130) = 4.28, $p < .04$), but these groups did not differ on the other MASQ subscales (F's < 3.44, ps > .07). Given that marital status was related to MASQ scores, analyses were initially conducted statistically controlling for patients' marital status (cf. Miller & Chapman, 2001). Because the results obtained in these analyses were virtually identical to those of the uncontrolled analyses, analyses reported here collapse across marital status.[3]

Correlations between the MASQ subscales and measures of social anxiety, depression and nonsocial anxiety

Means and standard deviations for all study variables are presented in Table 2. Examination of the correlations among the MASQ subscales in Table 3 shows a pattern consistent with that reported by Watson, Weber et al. (1995) for their clinical sample. That is, the MASQ subscales assessing anxiety (GDA and AA) were highly correlated (r = .75) as were the MASQ subscales assessing depression (GDD and AD; r = .74). In contrast, the two specific symptom scales (i.e., AA and AD) were less highly correlated (r = .27). The two general distress scales were highly correlated (r = .61), but less highly correlated with the specific scales of the other construct (rs = .42 and .44). Z-tests of dependent correlations (Meng, Rosenthal, & Rubin, 1992) were calculated to compare the magnitudes of the correlations between each of the specific subscales (MASQ-AD and MASQ-AA) and each of the general distress subscales (MASQ-GDA and MASQ-GDD). Consistent with the tripartite model and the hypothesized structure of the MASQ (Watson, Clark et al., 1995), the MASQ-AA was more highly correlated with MASQ-GDA than MASQ-GDD (z = 5.87, $p < .0001$), whereas MASQ-AD was more highly correlated with MASQ-GDD than MASQ-GDA (z = 5.35, $p < .0001$). The correlation

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[3]Details of these analyses and any others reported in this paragraph are available on request from Richard G. Heimberg.

Table 2
Means and standard deviations for study variables

Measures	M	SD
MASQ: GDA	24.17	7.59
MASQ: AA	25.35	8.09
MASQ: GDD	31.19	11.24
MASQ: AD	67.48	14.53
LSAS-TS	73.68	23.05
SIAS	50.42	14.58
LSAS-FS	19.21	6.34
LSAS-FP	19.47	6.07
SPS	32.58	15.51
ASI	25.92	13.39
PSWQ	60.40	13.48
HRSD	6.01	5.60
BDI	12.66	8.37

Note: MASQ = Mood and Anxiety Symptom Questionnaire; GDA = General Distress Anxiety subscale of the MASQ; AA = Anxious Arousal subscale of the MASQ: GDD = General Distress Depression subscale of the MASQ; AD = Anhedonic Depression subscale of the MASQ; LSAS-TS = Total Social Phobia Score on the Liebowitz Social Anxiety Scale; SIAS = Social Interaction Anxiety Scale; LSAS-FS = Fear of Social Interaction subscale of the Liebowitz Social Anxiety Scale; LSAS-FP = Fear of Performance subscale of the Liebowitz Social Anxiety Scale; SPS = Social Phobia Scale; ASI = Anxiety Sensitivity Index; PSWQ = Penn State Worry Questionnaire; HRSD = Hamilton Rating Scale for Depression; BDI = Beck Depression Inventory.

Table 3
Correlations among study variables

	1	2	3	4	5	6	7	8	9	10	11	12
MASQ Subscales												
1. MASQ:GDA	—											
2. MASQ:AA	.75**	—										
3. MASQ:GDD	.61**	.42**	—									
4. MASQ:AD	.44**	.27**	.74**	—								
Measures of social interaction anxiety												
5. SIAS	.39**	.26**	.43**	.44**	—							
6. LSAS-FS	.43**	.25**	.44**	.39**	.77**	—						
Measures of performance anxiety												
7. LSAS-FP	.39**	.37**	.24**	.25**	.56**	.67**	—					
8. SPS	.44**	.43**	.25**	.27**	.53**	.54**	.75**	—				
Measure of overall social anxiety												
9. LSAS-TS	.44**	.32**	.38**	.39**	.73**	.90**	.88**	.68**	—			
Measures of non-social anxiety												
10. ASI	.35**	.34**	.16	.08	.09	.18*	.32**	.45**	.25**	—		
11. PSWQ	.33**	.27**	.32**	.23**	.17*	.28**	.27**	.18*	.27**	.37**	—	
Measures of depression												
12. HRSD	.37**	.33**	.48**	.37**	.19*	.24**	.15	.12	.24**	.10	.28**	—
13. BDI	.48**	.41**	.70**	.64**	.35**	.38**	.35**	.37**	.42**	.28**	.34**	.56**

Note: MASQ = Mood and Anxiety Symptom Questionnaire; MASQ; AD = Anhedonic Depression subscale of the MASQ; AA = Anxious Arousal subscale of the MASQ; GDA = General Distress Anxiety subscale of the MASQ; GDD = General Distress Depression subscale of the MASQ; SIAS = Social Interaction Anxiety Scale; LSAS-FS = Fear of Social Interaction subscale of the Liebowitz Social Anxiety Scale; LSAS-FP = Fear of Performance subscale of the Liebowitz Social Anxiety Scale; SPS = Social Phobia Scale; LSAS-TS = Total Social Phobia Score on the Liebowitz Social Anxiety Scale; ASI = Anxiety Sensitivity Index; PSWQ = Penn State Worry Questionnaire; HRSD = Hamilton Rating Scale for Depression; BDI = Beck Depression Inventory.
*$p < .05$. **$p < .01$.

between MASQ-AA and MASQ-AD was smaller than the correlations between MASQ-AA and MASQ-GDA ($z = 6.83$, $p < .0001$) or between MASQ-AA and MASQ-GDD ($z = 2.63$, $p < .005$). Furthermore, the correlation between MASQ-AD and MASQ-AA was smaller than the correlations between MASQ-AD and MASQ-GDD ($z = 6.53$, $p < .0001$) or between MASQ-AD and MASQ-GDA ($z = 3.05$, $p < .002$). Hence, the general and specific MASQ scales related to each other as expected in this sample of patients with social phobia.

Examination of the relationships of the MASQ anxiety subscales and the social anxiety measures revealed correlations in the moderate range ($rs = .25–.44$). Correlations of the MASQ anxiety subscales and the nonsocial anxiety measures showed a similar pattern ($rs = .27–.35$). However, the MASQ anxiety subscales were also moderately related to the depression measures ($rs = .33–.48$). The MASQ depression subscales were highly correlated with the BDI ($rs = .64$ and $.70$), whereas their correlations with the HRSD were more moderate ($rs = .37$ and $.48$). The correlations between the MASQ depression subscales and the measures of social anxiety and nonsocial anxiety were also in the moderate range ($rs = .23–.44$), with the exception of the ASI, which was not significantly related to either of the MASQ depression scales ($rs = .08$ and $.16$).

Partial correlations between MASQ specific tripartite factors and overall social anxiety, social interaction anxiety, and performance anxiety controlling for general distress/negative affect

Partial correlations were used to examine the unique associations between the specific tripartite factors and measures of overall social anxiety, social interaction anxiety, and performance anxiety, when statistically controlling for general distress or negative affect (i.e., MASQ-GDA and MASQ-GDD). Consistent with findings from Brown et al. (1998), MASQ-AD ($r = .18$, $p = .045$), but not MASQ-AA ($r = .05$, $p = .58$) was significantly related to our clinician-rated measure of overall social anxiety (i.e., LSAS-TS). With regard to measures of social interaction anxiety, the MASQ-AD ($r = .18$, $p = .04$), but not MASQ-AA ($r = -.01$, $p = .92$) was significantly related to the SIAS controlling for general distress/negative affect. However, neither specific factor (MASQ-AD or -AA) was significantly associated with the LSAS-FS when controlling for general distress/negative affect. Conversely, on measures of performance anxiety, the MASQ-AA ($r = .23$, $p = .009$; $r = .18$, $p = .04$), but not MASQ-AD ($r = .16$, $p = .06$; $r = .12$, $p = .18$) was significantly related to both the SPS and LSAS-FP when controlling for general distress/negative affect.

Differences in correlations between the MASQ subscales and types of social anxiety

In order to examine the relations between the tripartite factors and the two types of social anxiety, tests of dependent correlations (Meng et al., 1992) were used to compare the magnitudes of the correlations between the social anxiety measures and the specific subscales of the MASQ (AD and AA). Consistent with our hypotheses, the SPS, a measure of performance anxiety, was more strongly related to MASQ-AA than MASQ-AD ($z = 1.66$, $p = .05$), whereas the SIAS, the measure of social interaction anxiety, was more strongly related to MASQ-AD than MASQ-AA ($z = 1.86$, $p = .03$). There was a trend for the magnitude of the correlation between LSAS-FS (fear of social interaction situations) and MASQ-AD to be higher than the magnitude of the correlation of LSAS-FS and MASQ-AA ($z = 1.42$, $p = .08$), but there was no statistical difference in the magnitude of the correlations between the LSAS-FP scale (fear of performance situations) and the MASQ-AA subscale versus the MASQ-AD subscale ($z = 1.21$, $p = .11$).

Differences in correlations between the MASQ subscales and measures of depression and nonsocial anxiety

For completeness, we examined the relationships of the MASQ subscales to the measures of depression and nonsocial anxiety. The BDI demonstrated a higher correlation with MASQ-AD than with MASQ-AA ($z = 2.77$, $p = .003$), whereas the HRSD did not ($z = .41$, $p = .34$). The ASI demonstrated a higher correlation with MASQ-AA than MASQ-AD ($z = 2.53$, $p = .006$), whereas the PSWQ did not ($z = .39$, $p = .35$).

Table 4
Summary of multiple regression analyses

Criterion	Predictor	R^2	β	pr	pr^2
SPS		.21***			
	MASQ-AA		.39	.39	.15***
	MASQ-AD		.15	.16	.03
LSAS-FP		.16***			
	MASQ-AA		.33	.32	.10***
	MASQ-AD		.15	.15	.03
SIAS		.21***			
	MASQ-AA		.14	.15	.03
	MASQ-AD		.39	.39	.15***
LSAS-FS		.17***			
	MASQ-AA		.15	.15	.03
	MASQ-AD		.34	.34	.12***

Note: SPS = Social Phobia Scale; LSAS-FP = Fear of Performance subscale of the Liebowitz Social Anxiety Scale; SIAS = Social Interaction Anxiety Scale; LSAS-FS = Fear of Social Interaction subscale of the Liebowitz Social Anxiety Scale. MASQ = Mood and Anxiety Symptom Scale; AA = Anxious Arousal subscale of the MASQ; AD = Anhedonic Depression subscale of the MASQ.
***$p < .001$.

Unique contribution of the specific tripartite factors to the prediction of types of social anxiety

Multiple regression analyses were conducted to examine the degree to which the specific tripartite factors (MASQ-AA and MASQ-AD) were uniquely associated with performance anxiety and social interaction anxiety. Each of the social anxiety measures served, in turn, as the criterion variable in these analyses (i.e., two measures for each type of fear: one self-report and the other clinician-administered). MASQ-AA and MASQ-AD served as the predictors and were entered into each equation simultaneously. Results of these analyses are presented in Table 4.

Examination of Table 4 reveals that the MASQ-AA made a significant unique contribution to the prediction of both measures of performance anxiety, accounting for 10% of the variance in LSAS-FP scores and 15% of the variance in SPS scores, but did not make a significant contribution to the prediction of the social interaction anxiety measures. MASQ-AD made a significant unique contribution to the prediction of both measures of social interaction anxiety, accounting for 12% of the variance in LSAS-FS scores and 15% of the variance in SIAS scores, but did not make a significant contribution to the prediction of the performance anxiety measures.

Discussion

Consistent with the findings of previous research (e.g., Brown et al., 1998), results of this study provide further evidence that social phobia is associated with the low positive affect or AD factor rather than the AA factor of the tripartite model when controlling for general distress or negative affect. However, when examining the two distinct types of social anxiety experienced by individuals with social phobia (social interaction anxiety and performance anxiety), the associations between the specific tripartite factors and social anxiety appear to be more complex. Specifically, low positive affect appears to be more strongly associated with social interaction anxiety. Conversely, as predicted by the tripartite model, performance anxiety experienced by individuals with social phobia was more strongly associated with the AA factor. These findings were further substantiated by regression analyses, which revealed that the AD factor accounted for unique variance in social interaction anxiety as assessed by both self- and clinician-report, whereas the AA factor did not. Conversely, the AA factor, but not the AD factor, accounted for unique variance in both self- and clinician reports of performance anxiety. Overall, these findings suggest that individuals with social phobia

who experience excessive social interaction anxiety may be better characterized as having low positive affect whereas those with excessive performance anxiety may be characterized by high physiological arousal or panic-like symptoms. Findings from this study underscore the need to further examine the relations of the specific components of the tripartite model (and its reformulation) to other anxiety disorder syndromes in order to more accurately delineate the unique components of each syndrome (Mineka et al., 1998).

The *DSM* makes the distinction between two types of social phobia, generalized and nongeneralized. Individuals who experience anxiety in and/or avoid most social situations would be diagnosed with the generalized subtype whereas individuals who experience excessive anxiety and/or avoidance of specific performance situations (public speaking, writing in public, performing in front of others) would most likely receive a diagnosis of nongeneralized social phobia. Individuals with the generalized subtype typically experience more severe social interaction anxiety. Findings from this study suggest that individuals with generalized social phobia would probably experience low positive affect. Furthermore, it is typical of individuals with the nongeneralized type to experience performance anxiety and to experience greater levels of autonomic arousal compared to those with the generalized subtype (Heimberg, Hope, Dodge, & Becker, 1990; Levin et al., 1993). Thus, the generalized subtype may be more closely related to the mood disorders whereas the nongeneralized subtype may be more closely related to other anxiety disorders, particularly panic disorder or specific phobias. In fact, individuals with the generalized subtype of social phobia are more likely to have a mood disorder during their lifetime (Mannuzza et al., 1995). In post hoc analyses, patients with generalized social phobia in the current study did have significantly higher scores on the MASQ-AD (and MASQ-GDD) than patients with nongeneralized social phobia. However, these groups did not differ significantly on either of the MASQ anxiety subscales (AA or GDA).[4]

With regard to the convergent and discriminant validity of the MASQ subscales, findings from this study suggest that they may not clearly differentiate anxiety and depression in individuals with social phobia. Subscale intercorrelations suggest that the MASQ depression and anxiety subscales measured their underlying constructs as intended. However, correlational analyses revealed only moderate convergent validity of the MASQ anxiety subscales with established measures of social anxiety, generalized anxiety (worry), and panic (anxiety sensitivity). The convergent validity of the MASQ depression subscales was somewhat stronger than the convergent validity of the MASQ anxiety subscales, but there was little support for the discriminant validity of either the anxiety and depression subscales. Moreover, unlike Watson, Weber et al. (1995), we did not find consistent evidence that the specific subscales provided improved discriminant validity. However, it may be the case that some of the measures used in this study differ in the degree to which they tap into the constructs of AA and anhedonia/low positive affect that are central to the tripartite model, and this may have influenced the results of our analyses of convergent and discriminant validity. In fact, PSWQ scores are known to be elevated in both anxiety and depression (Fresco, Heimberg, Mennin, & Turk, 2002; Meyer et al., 1990). Overall, findings from this study provided only modest support for the convergent and discriminant validity of the MASQ among individuals with social phobia and bolster the notion that measures need to be re-evaluated with samples different than the ones in which they were originally developed (Coles et al., 2001; Kazdin, 1998).

One potential reason for the inconsistencies between our results and those of Watson, Weber et al. (1995) may stem from the fact that the MASQ was developed by culling items primarily from *DSM-III-R* (American Psychiatric Association, 1987) diagnostic criteria for panic disorder, GAD, and post-traumatic stress disorder but not other anxiety disorders such as social phobia. Furthermore, the *DSM-III-R* criteria for these three anxiety disorders all include substantial physiological arousal that are not part of the symptom criteria for social phobia. Hence, the items that make up the MASQ anxiety scales may be more specific to panic disorder

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[4]On a post hoc basis, we compared patients who met criteria for generalized social phobia ($n = 114$) to those whose social anxiety was of the nongeneralized type ($n = 20$). Subtype information was not available for 14 patients. Patients with generalized social phobia had significantly higher scores than patients with nongeneralized social phobia on both MASQ depression subscales: Their MASQ-AD scores ($M = 69.40$; $SD = 14.13$) were significantly higher than those of patients with nongeneralized social phobia ($M = 59.30$; $SD = 15.66$; $F (1, 129) = 8.37$, $p < .004$). They also had significantly higher scores on MASQ-GDD ($M = 33.01$; $SD = 11.02$) than patients with nongeneralized social phobia ($M = 23.65$; $SD = 10.98$; $F (1, 129) = 12.23$, $p < .001$). However, there were no differences between patients with generalized versus nongeneralized social phobia on either of the MASQ anxiety subscales. Details of these analyses and of comparison of patients with generalized versus nongeneralized social phobia on other measures employed in this study are available on request from Richard G. Heimberg.

and PTSD (cf. Brown et al., 1997; Norton et al., 1997) and thus may not generalize to social phobia or other anxiety disorders including GAD, given recent changes to diagnostic criteria (e.g., DSM-IV's elimination of symptoms of autonomic hyperarousal in favor of symptoms of central nervous system arousal). Sample characteristics such as current anxiety and depressive symptoms may be another explanation for why Watson, Weber et al. (1995) found better convergent and discriminant validity. That is, their clinical sample consisted of individuals (predominately males) with alcohol and substance use disorders who did not consistently report substantial levels of anxiety. Thus, as they noted, findings from their study may not generalize to other clinical samples meeting criteria for anxiety or mood disorders.

This study is not without limitations. Participants only included individuals with a principal diagnosis of social phobia. Hence, future research needs to examine the convergent and divergent validity of the MASQ and the relations of the tripartite factors with other anxiety disorders such as GAD, obsessive-compulsive disorder, and specific phobias. This type of research is especially important given that the MASQ was developed using symptoms from a previous version of the *DSM* and included only symptoms from a few of the current anxiety disorders. Finally, a quarter of our sample had a secondary mood disorder. Although depression is a common comorbid diagnosis among persons with social phobia (Kessler, Stang, Wittchen, Stein, & Walters, 1999), the impact on our results is unknown. Estimates of the rates of depression among individuals with social phobia in clinical studies vary widely from study to study. For example, Turner, Beidel, Borden, Stanley, and Jacob (1991) reported 3% of individuals with social phobia in their study had comorbid major depression, whereas Stein, Tancer, Gelernter, Vittone, and Uhde (1990) reported 35% had comorbid major depression. Although our rate of comorbid depression was within this range, it is unclear if greater rates of depression would have improved the convergent and discriminant validity of the MASQ in this sample. Future research may focus on the separate and combined effects of social phobia and depression on response to the MASQ. These limitations notwithstanding, the current results expand our understanding of the unique characteristics of two types of social anxiety experienced by individuals with social phobia and their relations to the specific components of the tripartite model of anxiety and depression.

Acknowledgments

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