



Anxiety Disorders  
18 (2004) 825–839

JOURNAL  
OF  
**Anxiety  
Disorders**

## Psychometric properties of disability measures among patients with social anxiety disorder<sup>☆</sup>

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Received 6 January 2003; received in revised form 8 September 2003; accepted 17 October 2003

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### Abstract

**Background:** Although recognition of the importance of disability as a construct has increased in recent years, there has been little examination of the reliability and validity of disability measures. **Methods:** This study examined three disability measures, the Liebowitz Self-Rated Disability Scale (LSRDS), the clinician-rated Disability Profile (DP), and the Sheehan Disability Scale (SDS) among patients with a primary diagnosis of social anxiety disorder. **Results:** The disability measures correlated strongly with each other, as well as with measures of social anxiety, depressive symptoms, and patients' subjectively-evaluated quality of life. The LSRDS and DP were more internally consistent than the SDS Total Score. All measures discriminated between patients with generalized and non-generalized social anxiety disorder. However, the LSRDS and DP also showed greater sensitivity to ecological indicators of distress than the SDS. Social anxiety symptoms accounted for significant variance in disability, above and beyond that accounted for by depressive symptoms. **Conclusions:** Overall, the LSRDS, DP, and SDS appear to be valid tools in the study of disability in social anxiety disorder, although the

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<sup>☆</sup> Portions of this paper were presented at the annual meeting of the Anxiety Disorders Association of America, Atlanta, GA, March, 2001.

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LSRDS and the DP appear to be somewhat more sensitive to the experiences of socially anxious patients.

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*Keywords:* Liebowitz Self-Rated Disability Scale; Sheehan Disability Scale; Brief Fear of Negative Evaluation Scale

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As a construct, disability bridges the gap between the deeply personal impact a disorder has on an individual and its effect on his or her ability to fulfill roles as student, worker, spouse, or parent. Disability is certainly related to the presence and severity of symptoms, and the level of disability changes in relation to symptom remission (Olfson et al., 1997). However, disability may also vary among individuals with the same type and intensity of symptoms (Schneier et al., 1994). Rather than emphasizing the personal experience of various symptoms, disability assessment focuses on how a disorder interferes with the individual's ability to act in the world. Disability is one of the critical diagnostic criteria for most psychiatric disorders (American Psychiatric Association, 1994), and it is an important determinant of a patient's need for service (Goering, Lin, Campbell, Boyle, & Offord, 1996). Disability measures also provide an important index of the effectiveness of treatment (Goering et al., 1996; Schneier et al., 1994). Surprisingly, although disability is so important to our understanding of the impact of a disorder and our success in treating it, the measures used to examine disability have rarely been compared and their psychometric properties have rarely been investigated.

Social anxiety disorder provides a good example of the need to assess disability in addition to symptom severity. Symptomatically, individuals with social anxiety disorder experience fear in one or more social situations. With regard to disability arising from such symptoms, impairment in the domain of social relationships would be expected to be common. Indeed, Turner, Beidel, Dancu, and Keys (1986) found that 69% of individuals with social anxiety disorder reported impairment in general social relationships, and half of the unmarried individuals in the study reported impairment in their relationships with persons of the opposite sex. In an epidemiological sample, Wittchen, Fuetsch, Sonntag, Muller, and Liebowitz (1999) found that significantly more individuals with social anxiety disorder were never married or were divorced than those without the disorder. A study of psychiatric disorders and relationships found that individuals with social anxiety disorder had fewer friends than persons without mental disorder and reported that they had trouble getting along with the friends they had (Whisman, Sheldon, & Goering, 2000).

However, when measuring disability associated with social anxiety disorder, the focus must go beyond disrupted social relationships. Symptoms of social anxiety disorder may have a direct negative impact on occupational functioning, such as when a person fails to obtain employment for fear of job interviews, when

the interpersonal demands of a job lead to impaired performance, or when jobs are chosen for the degree to which they minimize feared social contact rather than the extent to which they match the person's interests and skills. At least a third of afflicted individuals find that coping with social anxiety disorder significantly reduces their productivity (Ballenger et al., 1998). An examination of social anxiety disorder in a primary medical care setting found individuals with social anxiety disorder reported missing an average of 3 days of work and having an average of 6 days of reduced productivity in the last month because of their emotional problems (Stein, McQuaid, Laffaye, & Cahill, 1999). Comparatively, mentally healthy individuals reported less than 1 day of lost work and reduced productivity combined. Unemployment, underemployment (working at a level below the individual's abilities), and financial dependency are all characteristic of individuals with social anxiety disorder (Mannuzza et al., 1995; Weiller, Bisserbe, Boyer, Lepine, & Lecrubier, 1996; Wittchen et al., 1999).

Social anxiety disorder may also be a risk factor for other negative outcomes. It appears to be a risk factor for other disorders, such as major depression and alcoholism (Mannuzza et al., 1995; Olfson et al., 1997). Furthermore, individuals with social anxiety disorder are likely to consider their health to be poor (Weiller et al., 1996). Given this myriad of direct and indirect consequences of social anxiety, it is not surprising that individuals with social anxiety disorder are at greater risk for suicidal ideation than persons without the diagnosis (Schneier, Johnson, Hornig, Liebowitz, & Weissman, 1992).

Some researchers have raised the question of how much of the interference associated with social anxiety disorder might be attributable to its association with other disorders, especially depression (Stein et al., 1999; Weiller et al., 1996). Stein and Kean (2000) examined these relationships in an epidemiological sample and found that associations between social anxiety disorder and various domains of disability and quality of life (e.g., family life, friends, and income) remained significant when controlling for depression. However, this question has not been addressed in a sample of patients with social anxiety disorder before the current study.

Perhaps the biggest challenge to the assessment of disability is the lack of clear understanding of the advantages and disadvantages of measures in current use. Two self-report measures, the Sheehan Disability Scale (SDS; Sheehan, 1983) and the Liebowitz Self-Rated Disability Scale (LSRDS; Schneier et al., 1994), and one clinician-rated measure, the Disability Profile (DP; Schneier et al., 1994), have been used to measure disability among individuals with social anxiety disorder.

The SDS was one of the first and is the most frequently used disability measure. It has demonstrated sensitivity to impairment and changes as a result of treatment across a wide range of disorders, including depression, bipolar disorder, specific phobias, agoraphobia, generalized anxiety disorder, substance abuse, eating disorders, and antisocial personality disorder, as well as social anxiety disorder (Olfson et al., 1997). Unfortunately, the SDS has only four items (of which only three are typically used). It is limited in terms of the specificity of information that

it elicits and the breadth of the content domain that it samples. Furthermore, the SDS asks only about current levels of impairment, providing no indication of whether the person has done better or worse in the past.

The LSRDS separately examines current and lifetime impairment in multiple domains as a result of the person's "emotional problem." Individual items may be examined to assess interference in particular domains as part of treatment planning (although the treatment validity of this approach has never been evaluated). In at least two different studies, the LSRDS scales have shown moderate to strong relationships with measures of symptoms and role functioning among individuals with social anxiety disorder (Schneier et al., 1994; Wittchen et al., 1999).

The DP is a clinician-rated instrument that examines both current and lifetime impairment in most of the same domains assessed by the LSRDS. Again, the individual is asked to specify disability resulting from a particular disorder. The DP has been used less frequently and little information is available on its reliability and validity beyond the data presented in the original article, in which it was shown to have good internal consistency and moderate to strong relationships with measures of symptomatology and disability in individuals with social anxiety disorder (Schneier et al., 1994). Neither the LSRDS nor the DP has been used extensively with other disorders, although nothing in their content precludes this possibility (Mendlowicz & Stein, 2000).

This study explores several aspects of the use of the SDS, LSRDS, and DP among persons presenting for treatment for social anxiety disorder. First, it investigates the internal consistency and validity of these measures, particularly in the way these disability measures relate to each other and to symptoms of social anxiety, depression, and quality of life. Second, it examines whether the disability measures are sensitive to demographic differences in the patient sample. Third, the study looks at the unique contribution of symptoms of social anxiety disorder to disability scores, to see if social anxiety disorder is disabling in its own right, or if instead, its disabling effects can be accounted for by its overlap with depression.

## 1. Method

### 1.1. *Participants and procedure*

Participants in this study were 153 individuals who presented for treatment for social anxiety disorder as part of research comparing the relative efficacy of medication, cognitive-behavioral therapy, or the combination, at one of three sites: the Center for Stress and Anxiety Disorders at the State University of New York at Albany (CSAD;  $n = 24$ ), the Adult Anxiety Clinic of Temple University (AACT;  $n = 72$ ), or the Anxiety Disorders Clinic of the New York State Psychiatric Institute (NYSPI;  $n = 57$ ). All met DSM-IV criteria for a principal diagnosis of social anxiety disorder as determined by structured interview.

Individuals presenting at the CSAD and the AACT were interviewed using the Anxiety Disorders Interview Schedule for DSM-IV: Lifetime Version (ADIS-IV-L; DiNardo, Bown, & Barlow, 1994). In a sample of 362 patients, Brown, DiNardo, Lehman, and Campbell (2001) obtained a kappa of .77 for a principal diagnosis of social anxiety disorder. Individuals presenting at the NYSPI were interviewed using the Structured Clinical Interview for DSM-IV for Axis I disorders (SCID-IV; First, Spitzer, Gibbon, & Williams, 1996). In a test of the reliability of the SCID for DSM-IV, both novice and experienced clinicians achieved good to excellent agreement in their diagnoses of Axis I disorders, as indicated by kappa coefficients of .85 at the completion of training and .76 at quality check (Ventura et al., 1998). All diagnostic interviews were administered by doctoral students or postdoctoral fellows trained and reliable in the administration of the interviews. Following the diagnostic interview, all patients were given a packet of questionnaires to take home and complete prior to the next appointment. Every self-report measure used in this study was administered as part of this packet. Patients were aware that treatment decisions were based on the diagnostic interview, and the decision regarding whether they would receive treatment through one of the clinics was made prior to return of the questionnaire packets.

Most comorbid diagnoses were allowed as long as they were not more severe than the social anxiety disorder. Individuals with bipolar I disorder, psychotic disorder, or substance abuse or dependence in the past 3 months were excluded. Furthermore, individuals with major depressive disorder were excluded at NYSPI, but not at AACT or CSAD.

Following random assignment to treatment condition and return of questionnaires by the patients, another interview was conducted for the purpose of monitoring progress through treatment. The DP was administered during this separate assessment interview, which was conducted by an independent assessor and consisted of relevant modules of the diagnostic interview as well as additional clinician-administered measures of symptomatology, disability, and personality functioning. The independent assessor was a different advanced doctoral student or postdoctoral fellow. Independent assessors were blind to patient responses on self-report questionnaires and treatment condition. In the AACT and CSAD sample, ADIS interviewer and independent assessor ratings of the presence of social anxiety disorder agreed in 100% of cases. ADIS interviewer ratings and independent assessor ratings of clinical severity were also within one point of each other (0–8 scale) in 100% of cases.

Participants at the three sites did not differ on sex, age, or marital status. The overall sample was 58.9% female and 41.1% male. Ages ranged from 19 to 65 ( $M = 32.80$ ,  $S.D. = 10.11$ ). The vast majority (72.5%) of patients were single, with the remainder being married (20.5%), divorced (4.0%), separated (2.0%), or widowed (0.7%). The three sites did differ with regard to highest level of education completed ( $\chi^2(8) = 25.66$ ,  $P < .001$ ). All CSAD patients (100%) and most AACT patients (90.2%) had at least some college education, but fewer NYSPI patients (36.3%) had achieved that level. The three sites also differed in

racial composition ( $\chi^2(8) = 28.96, P < .001$ ). Individuals identifying themselves as non-Hispanic Caucasians represented 40% of the NYSPI sample, compared with 72.5% of the AACT sample and 91.7% of the CSAD sample. African Americans were the next most common racial group, constituting 25.5% of the NYSPI sample, 15.9% of the AACT sample, and 8.2% of the CSAD sample. Hispanic Americans made up 25.5% of the NYSPI sample and 4.3% of the AACT sample. Other racial groups (i.e., Asian Americans and Native Americans) constituted 9.1% of the NYSPI sample and 7.2% of the AACT sample.

### 1.2. Disability measures

As previously indicated, three disability measures were examined in this study. Two of these measures were self-report measures, the SDS and the LSRDS. On the SDS, patients rate their current level of impairment in work, social life, and family life on a 0 (not at all) to 10 (very severe) scale. The sum of these first three items was used in this study to assess current levels of disability. The fourth item rates work and social disability on a 1 (no complaints, normal activity) to 5 (symptoms radically change or prevent normal work or social activities) scale, and the performance of this one-item scale was also examined. The LSRDS separately examines current and lifetime impairment in 11 domains: alcohol abuse, drug abuse, mood dysregulation, education, career, family relationships, romantic relationships, friendships, hobbies, activities of daily living, and suicidality. Ratings for the LSRDS range from 0 to 3, with 3 being most severe. The DP is a clinician-rated instrument that examines both current and lifetime impairment in the same domains assessed by the LSRDS, with the exception of the three items assessing alcohol abuse, drug abuse, and mood dysregulation. The range for the DP is 0 to 4, with 4 being most severe. The DP also includes question-specific information to help clinicians make their ratings. For example, for “School,” the DP instructs clinicians to rate the patient as “severe” if he or she dropped out of school temporarily but was able to return and finish, and “extreme” if he or she dropped out of school and was unable to finish.

### 1.3. Other measures

Measures targeting symptoms of social anxiety, depression, and subjectively-determined quality of life were also administered. The Liebowitz Social Anxiety Scale is a clinician-administered scale that evaluates fear and avoidance of 11 social interaction (e.g., talking to people in authority) and 13 performance (e.g., working while being observed) situations. It has been shown to have good internal consistency and is correlated with other measures of social anxiety (Heimberg et al., 1999). The Brief Fear of Negative Evaluation Scale (Leary, 1983) is a 12-item self-report instrument that assesses fear of being disapproved of and judged negatively by others. The Social Interaction Anxiety Scale (Mattick & Clarke, 1998) is a 20-item self-report measure that assesses anxiety experienced in dyadic

and group interactions. The Social Phobia Scale (Mattick & Clarke, 1998) is a 20-item self-report measure that assesses fear of performance and observation situations. These symptom measures have been widely used in the assessment of social anxiety disorder and have evidenced good reliability and validity in a number of studies (for reviews see Hart, Jack, Turk, & Heimberg, 1999; Heimberg & Turk, 2002).

The Beck Depression Inventory (Beck, Rush, Shaw, & Emery, 1979) is a 21-item self-report measure that assesses the presence and severity of depressive symptoms and has been demonstrated to have good validity in the study of social anxiety disorder (Coles, Gibb, & Heimberg, 2001). The Quality of Life Inventory (Frisch, Cornell, Villanueva, & Retslaff, 1992) is a self-report measure of satisfaction in 16 domains (e.g., friends, family, self-esteem), weighted by the relative importance of each domain to the individual. The Quality of Life Inventory has been shown to be associated with measures of severity, impairment, symptom expression, and depression in persons with social anxiety disorder (Safren, Heimberg, Brown, & Holle, 1997).

#### 1.4. Analyses

Internal consistency of the disability measures was investigated using Cronbach's  $\alpha$ . Correlations of corrected item score with total score were also evaluated to look at how each item contributed to the overall score. Pearson product-moment correlations were used to examine the relationships among the disability measures and between these measures and the symptom and quality of life measures. Paired-sample *t*-tests were used to evaluate differences between correlations (for a rationale for this approach, see Bruning & Kintz, 1987).

Differences based on subtype of social anxiety disorder (generalized or non-generalized) and measures of functioning drawn from demographic variables (marital status, living arrangement, and education level) were also assessed. The demographic variables were re-coded into two-level variables, based on whether indicators of problematic functioning were present or absent. Differences in disability scores by subtype of social anxiety disorder, sex, marital status, and living arrangement were investigated using independent-sample *t*-tests (Bonferroni corrected to  $P = .02$ ). Because of the significant differences between sites on education level and racial background,  $3 \times 2$  (site by education or race) analyses of variance were used to examine differences in disability levels for these variables.

Hierarchical regression analyses were used to examine the contribution of social anxiety symptoms above and beyond depression to disability in this sample of patients with social anxiety disorder. These analyses were conducted separately for each disability scale, and probability levels were accordingly Bonferroni-corrected ( $P = .008$ ). The Beck Depression Inventory was entered on the first step and all social anxiety measures were entered as a block on the second step.

## 2. Results

### 2.1. Internal consistency of the disability measures

Cronbach’s  $\alpha$  was used to gauge the internal consistency of the disability measures. For the purposes of this analysis, the Work and School items of the LSRDS—Current scale and the DP—Current scale were collapsed into a single item. This strategy was necessary because patients are instructed to answer one item or the other, depending on whether they currently identify themselves as students or as part of the work force. Both scales of the LSRDS were quite internally consistent (LSRDS—Current  $\alpha = .75$ ; LSRDS—Lifetime  $\alpha = .82$ ), as were the scales of the DP (DP—Current  $\alpha = .71$ ; DP—Lifetime  $\alpha = .79$ ). The three-item SDS Total Score was less internally consistent, a common finding in brief measures ( $\alpha = .55$ ).

For each scale, correlations of item scores with the corrected total score were calculated in order to examine how each item contributed to the overall score. For the LSRDS—Current, these correlations ranged from .38 to .65 (except drinking alcohol, for which  $r = -.11$ , and using drugs of abuse, for which  $r = .10$ ). The LSRDS—Lifetime demonstrated a similar pattern. Correlations ranged from .41 to .62, except for drinking alcohol ( $r = .25$ ) and using drugs of abuse ( $r = .15$ ). The correlations for the DP ranged from .22 to .62 for the DP—Current scale and .32 to .62 for the DP—Lifetime scale. For the SDS, these correlations ranged from .27 to .51.

### 2.2. Correlations and comparisons among measures

As depicted in Table 1, the disability measures were highly intercorrelated. The LSRDS and DP scales were more highly correlated with the SDS Total Score than the Work and Social Disability Score. However, the paired-sample *t*-tests of differences between dependent correlations revealed that these differences were significant only in the comparison involving the LSRDS—

Table 1  
Correlations among the disability measures

	LSRDS— Current	LSRDS— Lifetime	DP— Current	DP— Lifetime	SDS Total Score
LSRDS—Lifetime	.64				
DP—Current	.65	.53			
DP—Lifetime	.60	.71	.79		
SDS Total Score	.70	.57	.56	.57	
SDS—Work and Social Disability	.54	.39	.48	.48	.62

Note. For all *r*'s,  $P < .001$ . Degrees of freedom vary between 114 and 145 because of missing values. SDS—Sheehan Disability Scale; LSRDS—Liebowitz Self-Rated Disability Scale; DP—Disability Profile. SDS Total Score defined as sum of first three items.

Table 2

Correlations of the disability measures with measures of social anxiety, depression, and quality of life

	Measures of social anxiety, depression and quality of life					
	BFNE	SIAS	SPS	LSAS total	BDI	QOLI
LSRDS—Current	.43	.50	.43	.51	.60	-.51
LSRDS—Lifetime	.40	.44	.31	.42	.39	-.41
DP—Current	.47	.61	.48	.72	.46	-.45
DP—Lifetime	.50	.60	.38	.63	.52	-.50
SDS Total Score	.40	.50	.41	.53	.56	-.47
SDS—Work and Social Disability	.41	.43	.34	.49	.40	-.37

Note. For all  $r$ 's,  $P < .001$ . Degrees of freedom vary between 113 and 146 because of missing values. SDS—Sheehan Disability Scale; LSRDS—Liebowitz Self-Rated Disability Scale; DP—Disability Profile; BFNE—Brief Fear of Negative Evaluation Scale; SIAS—Social Interaction Anxiety Scale; SPS—Social Phobia Scale; LSAS—Liebowitz Social Anxiety Scale; BDI—Beck Depression Inventory. SDS Total Score defined as sum of first three items.

Current ( $t(132) = 3.10$ ,  $P = .001$ ) and the LSRDS—Lifetime ( $t(111) = 2.69$ ,  $P = .004$ ).

Examination of Table 2 indicates that the disability measures were also strongly related to measures of social anxiety, depression, and quality of life. There were no significant differences in the strength of correlations between any of the disability measures and the measures of social anxiety, depressive symptoms, or quality of life. It is noteworthy that, although the correlations between the disability measures and the Quality of Life Inventory were substantial, none of them were higher than  $-.51$ , meaning that no disability measure shared more than 26% of its variance with the measure of subjective life satisfaction and suggesting that disability and subjective life satisfaction are related but independent constructs.

### 2.3. Differences in disability as a function of subtype of social anxiety disorder

Generalized social anxiety disorder has frequently been associated with greater symptom severity and impairment than non-generalized social anxiety disorder (e.g., Brown, Heimberg, & Juster, 1995; Herbert, Hope, & Bellack, 1992; Turner, Beidel, & Townsley, 1992). As Table 3 indicates, individuals who met criteria for the generalized subtype of social anxiety disorder ( $n = 124$ ) reported higher overall disability than individuals with the non-generalized subtype of social anxiety disorder ( $n = 29$ ). These differences were reflected in significantly higher means on all disability measures, as assessed by independent sample  $t$ -tests.

### 2.4. Ecological validity of the disability measures

Problems in marital status, living situation, and educational attainment were reflected in higher mean disability scores, as shown in Table 4. Individuals who

Table 3

Means (and standard deviations) of disability measures and *t*-tests for subtype of social anxiety disorder

	Generalized		Non-generalized		<i>t</i>
	<i>M</i>	S.D.	<i>M</i>	S.D.	
LSRDS—Current	9.82	4.89	4.93	3.98	4.84
LSRDS—Lifetime	16.96	6.45	10.30	6.68	4.20
DP—Current	9.84	4.47	5.12	3.50	5.05
DP—Lifetime	14.19	5.38	7.15	4.70	6.27
SDS Total Score	16.60	5.74	11.97	5.51	3.94
SDS—Work and Social Disability	4.01	0.86	3.54	1.07	2.39

*Note.* For all *t*'s,  $P < .001$ . Degrees of freedom vary between 120 and 150 because of missing values. SDS—Sheehan Disability Scale; LSRDS—Liebowitz Self-Rated Disability Scale; DP—Disability Profile. SDS Total Score defined as sum of first three items.

were single, divorced, or separated reported a mean disability level significantly higher than individuals who were married or widowed on both scales (current and lifetime) of the DP. There was no difference as a function of marital status on either scale of the SDS (Total or Work and Social Disability). Patients who lived alone or with their parents had higher scores on both scales of the DP than patients who lived with a spouse, significant other, or children. However, scores on the SDS Total, SDS Work and Social Disability Scale, and the two scales of the LSRDS did not differ as a function of living arrangement.

As reflected in Table 4, patients who had not completed college had significantly higher mean scores on all the disability measures than patients who had completed college or achieved a post-graduate degree, with the exceptions of the LSRDS—Current scale and the Work and Social Disability Scale. The site by education interaction was not significant.

In addition to these analyses, disability scores were correlated with reported income level. Only the LSRDS—Current scale correlated significantly with income ( $r = -.23$ ,  $P < .05$ ). There were no differences on any of the disability measures as a function of race or sex.

### 2.5. Depression and social anxiety in the experience of disability

Table 5 summarizes the results of the regression analyses investigating the contribution of social anxiety disorder to disability, after controlling for depression.<sup>1</sup> Depression, as assessed by Beck Depression Inventory scores, substantially

<sup>1</sup> Because the New York site did not include individuals with major depression, this analysis was run twice, once including all patients, and the second time excluding the New York patients. The contribution of social anxiety disorder over and above depressive symptoms remained significant in both cases. Because the focus of the paper is on disability associated with social anxiety disorder, the decision was made to report only the analysis including all subjects, but the results of the other analysis are available upon request.

Table 4  
Disability means (standard deviations) and tests for comparisons between demographic indicators

	Marital status			Education			Living arrangement		
	Single/ divorced/ separated	Married/ widowed	<i>t</i>	Some HS/ some college	Degree/ post-graduate	<i>F</i>	Alone/ parents	Spouse/significant other/children	<i>t</i>
LSRDS—Current	9.63 (5.04)	5.93 (4.43)	3.60*	9.87 (5.21)	7.62 (4.52)	5.85	9.45 (4.07)	6.96 (5.09)	2.23
LSRDS—Lifetime	16.77 (6.32)	13.18 (7.58)	2.46	17.64 (6.12)	14.00 (6.90)	15.56*	17.05 (7.19)	14.00 (7.78)	1.52
DP—Current	9.55 (4.65)	6.36 (4.08)	3.32*	10.53 (4.84)	7.15 (3.77)	18.30*	9.85 (3.74)	6.32 (4.20)	3.52*
DP—Lifetime	13.63 (5.74)	10.17 (5.75)	2.89*	13.96 (6.04)	11.78 (5.43)	5.48	14.27 (5.23)	10.43 (5.70)	2.77*
SDS Total Score	16.03 (6.04)	14.16 (5.43)	1.57	17.32 (6.17)	13.90 (5.20)	8.39*	15.68 (5.57)	14.62 (4.99)	0.78
SDS—Work and Social Disability	3.92 (0.94)	3.86 (0.89)	0.31	3.96 (0.97)	3.86 (0.88)	0.02	3.83 (0.79)	3.96 (0.82)	0.59

*Note.* Degrees of freedom vary between 58 and 150 because the sample is drawn only from the CSAD and AACT sites for living arrangement and because of missing values. An analysis of variance was used for education instead of a *t*-test because of site differences. SDS—Sheehan Disability Scale; LSRDS—Liebowitz Self-Rated Disability Scale; DP—Disability Profile. SDS Total Score defined as sum of first three items.

\*  $P < .02$ .

Table 5

Variance in disability measures accounted for by social anxiety above and beyond contribution of depression (Beck Depression Inventory)

	Total variance accounted for ( $R^2$ )	$R^2$ for BDI alone	$R^2$ change after entering social anxiety measures	$F$ of change
LSRDS—Current	.50	.38	.12	$F(5, 135) = 6.63$
LSRDS—Lifetime	.32	.17	.15	$F(5, 112) = 4.95$
DP—Current	.58	.24	.34	$F(5, 133) = 21.91$
DP—Lifetime	.55	.29	.25	$F(5, 133) = 14.84$
SDS Total Score	.46	.34	.12	$F(5, 140) = 6.38$
SDS Work and Social Disability	.31	.18	.13	$F(6, 131) = 11.36$

*Note.* For all  $F$ 's,  $P < .0001$ . Degrees of freedom vary because of missing values. SDS—Sheehan Disability Scale; LSRDS—Liebowitz Self-Rated Disability Scale; DP—Disability Profile; BDI—Beck Depression Inventory. SDS Total Score defined as sum of first three items.

contributed to all disability scores. However, social anxiety accounted for significant additional variance in each disability measure, especially on the DP.

### 3. Discussion

Overall, the disability measures demonstrated good internal consistency and validity in the measurement of functional impairment in social anxiety disorder. The LSRDS and DP were somewhat more internally consistent than the SDS Total Score. Because the SDS is a shorter scale, this finding was expected; however, this result still signifies that the SDS is difficult to interpret because of its brevity and the global generality of its item content. Although internal consistency was good for both the Current and Lifetime scales of the LSRDS and DP, it was somewhat lower than in the original article, which reported  $\alpha$ 's ranging from .87 to .92 (Schneier et al., 1994). Similarly, the range of corrected item-total correlations for the LSRDS and DP was lower than in the original study. However, the  $\alpha$ 's in this study are remarkably comparable, especially considering that the sample in the original study was much less diverse and that all the information was collected at a single site in that study, compared with three sites in the current study. The lifetime scales of the LSRDS and DP also appeared to be somewhat more internally consistent than the current scales. It is also important to note that because the LSRDS and DP scales were administered at different times and in different contexts (the LSRDS at home and the DP at an interview at least a week later), the correlation between these scales is likely to be attributable to the measurement characteristics of the scales themselves, and not recollection of or the desire to be consistent with previous responses.

The validity of the disability measures is supported by their strong relationships with one another and with measures of social anxiety, depression, and quality of

life. The disability scales were highly intercorrelated. All of the disability scales reflected significant differences as a function of subtype of social anxiety disorder. However, the clinician-rated DP appeared more sensitive to ecological indicators of distress than the self-report measures. Both scales of the DP were sensitive to differences in marital status, and living arrangement, and the DP—Current scale was sensitive to all three of the domains, the LSRDS—Current was sensitive only to differences in marital status, the LSRDS—Lifetime and the SDS Total Score were sensitive only to differences in education. The Work and Social Disability Scale was not sensitive to any of the ecological indicators. Clinician sensitivity (or alternatively, clinician bias) to more subtle indicators of disability may heighten the DP's sensitivity to particular areas of difficulty in patients' lives.

As reflected by the regression analyses, depression was a major contributor to the disability scores on all of the scales. Still, symptoms of social anxiety accounted for significant variance in the disability measures after depression was controlled. These results support previous work suggesting that symptoms of social anxiety disorder are disabling in their own right and not just as a function of the high comorbidity of social anxiety disorder and depression (Schneier et al., 1992; Stein & Kean, 2000; Wittchen et al., 1999).

Comparing the three measures, we come to several conclusions. First, all of the measures were meaningfully related to social anxiety, depression, and life satisfaction. Second, the LSRDS and DP appeared to be more internally consistent measures of disability in social anxiety disorder than the SDS. Third, the DP showed greater sensitivity to ecological indicators of distress than the LSRDS, SDS Total Score, and the Work and Social Disability Scale. The utility of the Work and Social Disability Scale, in particular, appears to be limited.

This study has a few limitations. Exclusion criteria for the study limit the generalizability of the sample. Although some allowance was made for comorbidity, this sample consists entirely of individuals with a primary diagnosis of social anxiety disorder, and therefore the results most accurately describe individuals with this diagnosis. Furthermore, difficulty with alcohol and drugs are common among individuals with social anxiety disorder, but individuals with current alcohol or substance abuse problems were excluded from this study. These individuals might have scored differently on the LSRDS items regarding abuse of alcohol and drugs than the patients who were included in the study sample, and this may have reflected on the poor showing of the relevant LSRDS items. Another major limitation is the restricted range of demographic indicators considered in this study. Additionally, in our use of demographic indicators of disability, we make some assumptions that are probably not valid for every case. For instance, marriage is broadly construed as “non-problematic,” placing in the same category individuals who are in happy relationships and individuals stuck in unsatisfying marriages because they are too socially anxious to end the relationship.

Future work should examine a few issues. The LSRDS and DP have primarily been psychometrically evaluated in patients with social anxiety disorder, although the items on each scale can be productively applied to other disorders. The

measures have also not been subjected to additional tests of reliability, particularly test–retest reliability, and, in the case of the DP, inter-rater reliability. This study also suggests that there is some distinction between the constructs of disability and quality of life. Considering these concepts are frequently used interchangeably in the literature, further research is needed to more strongly define and distinguish between these concepts, both conceptually and empirically. Finally, this study concerned itself only with disability among untreated patients with social anxiety disorder. Considering that disability is an important marker not only of illness severity, but also treatment outcome, further study should explore the sensitivity of these measures to change.

## Acknowledgments

This study was supported by grants from the National Institute of Mental Health to Drs. Heimberg (MH44119) and Liebowitz (MH40121) and to the New York State Psychiatric Institute MHCRC (PO5 MH30906).

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