ORIGINAL ARTICLE

Social fears and social phobia in the USA: results from the National Comorbidity Survey Replication

A. M. Ruscio[1]*, T. A. Brown[2], W. T. Chiu[3], J. Sareen[4], M. B. Stein[5] and R. C. Kessler[3]

[1] *Department of Psychology, University of Pennsylvania, Philadelphia, PA, USA*

[2] *Department of Psychology, Boston University, Boston, MA, USA*

[3] *Department of Health Care Policy, Harvard Medical School, Boston, MA, USA*

[4] *Department of Psychiatry and Community Health Sciences, University of Manitoba, Winnipeg, Manitoba, Canada*

[5] *Department of Psychiatry, University of California, San Diego, CA, USA*

Background. Despite heightened awareness of the clinical significance of social phobia, information is still lacking about putative subtypes, functional impairment, and treatment-seeking. New epidemiologic data on these topics are presented from the National Comorbidity Survey Replication (NCS-R).

Method. The NCS-R is a nationally representative household survey fielded in 2001–2003. The World Health Organization (WHO) Composite International Diagnostic Interview Version 3.0 (CIDI 3.0) was used to assess 14 performance and interactional fears and DSM-IV social phobia.

Results. The estimated lifetime and 12-month prevalence of social phobia are 12.1% and 7.1% respectively. Performance and interactional fears load onto a single latent factor, and there is little evidence for distinct subtypes based either on the content or the number of fears. Social phobia is associated with significant psychiatric co-morbidity, role impairment, and treatment-seeking, all of which have a dose–response relationship with number of social fears. However, social phobia is the focus of clinical attention in only about half of cases where treatment is obtained. Among non-co-morbid cases, those with the most fears were least likely to receive social phobia treatment.

Conclusions. Social phobia is a common, under-treated disorder that leads to significant functional impairment. Increasing numbers of social fears are associated with increasingly severe manifestations of the disorder.

Introduction

Social phobia, also known as social anxiety disorder, is a condition involving marked anxiety about social or performance situations in which there is a fear of embarrassing oneself under scrutiny by others (APA, 1994). Epidemiological surveys have shown social phobia to be a common disorder characterized by substantial co-morbid psychopathology and functional impairment (Schneier *et al.* 1992; Magee *et al.* 1996; Furmark *et al.* 1999; Wittchen *et al.* 1999; Stein *et al.* 2000). Social phobia's earlier onset compared with many other mental disorders (Weissman *et al.* 1996; Kessler *et al.* 1999, 2005*a*; Wittchen *et al.* 1999) and close association with putative risk factors such as behavioral inhibition (Turner *et al.* 1996; Hayward *et al.* 1998) and low positive affect (Mineka

et al. 1998) suggest that social phobia may be an important target for broader prevention efforts as well as being a significant condition in its own right. However, despite growing awareness and understanding of social phobia (Heimberg *et al.* 1995; Tarrier, 2004; Coles & Horng, 2006), information is lacking on key aspects of the disorder. The current report aimed to address some of these gaps using data from the recently completed National Comorbidity Survey Replication (NCS-R; Kessler & Merikangas, 2004).

The NCS-R expands on earlier epidemiological surveys of social phobia in four important ways. First, previous community surveys have yielded widely varying estimates of the prevalence of social phobia and, consequently, the extent of the public health problem posed by the disorder (Stein *et al.* 1994; Magee *et al.* 1996; Alonso *et al.* 2004; Grant *et al.* 2005). To provide a more definitive prevalence estimate, social phobia diagnoses in the NCS-R were validated through independent semi-structured clinical

* Address for correspondence : Dr A. M. Ruscio, Department of Psychology, University of Pennsylvania, 3720 Walnut Street, Philadelphia, PA 19104, USA.

(Email : ruscio@psych.upenn.edu)

interviews. Second, although there is considerable interest in potential subtypes of social phobia (Heimberg *et al*. 1993; Furmark *et al*. 2000; Stein *et al*. 2000; Hofmann *et al*. 2004), few previous surveys have included a sufficiently large set of situational probes to test for subtype distinctions. The NCS-R assessed a larger number of social situations than previous surveys in order to address this issue, expanding in particular the assessment of interactional social fears. We consider evidence for subtypes based on number of social fears, such as the DSM-IV generalized subtype involving fears of 'most' social situations, and subtypes based on content of social fears, such as the distinction between performance and interactional fears that has been emphasized by some experts (Turner *et al*. 1992; Hook & Valentiner, 2002). Third, prior surveys have been limited by global measures of functional impairment and by a failure to separate the impairment due to social phobia *versus* co-morbid conditions. The NCS-R included a more extensive assessment of impairment than previous surveys and also assessed a wide range of co-morbid DSM-IV disorders. We control for co-morbid disorders to evaluate the unique effects of social phobia on role impairment. Finally, little is known about help-seeking in social phobia. We present novel data on utilization of mental health services by those with the disorder, including the proportion of affected cases who report receiving treatment specifically for social phobia.

Method

Sample

The NCS-R is a nationally representative face-to-face household survey of people aged 18+ years fielded between February 2001 and December 2003. Respondents were sampled using a multi-stage clustered area probability design. As in the baseline NCS (Kessler *et al*. 1994), an initial recruitment letter and study fact brochure were followed by a visit from a professional survey interviewer, who described the study and obtained verbal informed consent before the interview. The response rate was 70.9%.

The NCS-R interview included two parts administered in one session. Part I comprised the core diagnostic assessment and was administered to all respondents ($n=9282$). Part II assessed additional disorders and correlates and was administered to all Part I respondents with any lifetime core disorder plus a probability subsample of other respondents ($n=5692$). The Part I sample is used here to examine prevalence and course, role impairment, treatment, and co-morbidity of DSM-IV social phobia with other Part I disorders. The Part II sample is used to examine

sociodemographic correlates and co-morbidity with disorders assessed only in the Part II sample. The Part I sample was weighted to adjust for differential probability of selection and for residual variation between sample and population distributions on geographic and sociodemographic variables in the 2000 US Census. The Part II sample was additionally weighted to adjust for the higher selection probability of Part I respondents with a lifetime disorder. Further description of NCS-R sampling and weighting procedures appears elsewhere (Kessler & Merikangas, 2004).

Social fears and social phobia

Social phobia was assessed by Version 3.0 of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI 3.0; Kessler & Ustun, 2004), a fully structured lay-administered interview. Respondents were administered the social phobia section if they endorsed a diagnostic stem question for either a performance or an interactional fear that was excessive and caused substantial distress, nervousness, or avoidance. The social phobia section assessed lifetime experiences of shyness, fear, or discomfort in each of 14 social situations. Respondents endorsing one or more of these fears were asked about age of the first fear and age of first avoidance. Responses of 'all my life' or 'as long as I can remember' were probed to determine whether onset occurred before first starting school (coded as age 4) or before (age 12) or after (age 13) the teenage years. Respondents were then assessed for DSM-IV social phobia. DSM-IV diagnostic hierarchy rules were not applied in making diagnoses of social phobia or any other mental disorder to minimize the impact of uncertain hierarchical exclusions on the relationship of social phobia with other disorders. The CIDI social phobia diagnoses were subsequently compared to clinical diagnoses based on the Structured Clinical Interview for DSM-IV (SCID; First *et al*. 2002) in blind clinical reinterviews of a probability subsample of NCS-R respondents (Kessler *et al*. 2004). The area under the receiver operating characteristic curve was 0.65 and the κ value (standard error) was 0.35 (0.07). The estimated prevalence of social phobia diagnosed by the CIDI was somewhat lower than that diagnosed by the SCID (McNemar $\chi^2_1 = 5.7$, $p = 0.017$), suggesting that the CIDI diagnoses are conservative.

Co-morbid DSM-IV disorders

Other anxiety, mood, substance use, and impulse-control disorders were assessed using CIDI 3.0. As detailed elsewhere (Haro *et al*. 2006), blinded clinical reappraisal interviews using the SCID found generally

good concordance between CIDI and SCID diagnoses of anxiety, mood, and substance use disorders. Diagnoses of impulse-control disorders were not validated due to the absence of a gold standard clinical assessment for these disorders in adults.

Other measures

Other correlates of social phobia examined here include sociodemographics, role impairment, and treatment-seeking. The sociodemographic variables include age at interview, sex, race-ethnicity, education, marital status, employment status, and family income. Impairment among 12-month cases was assessed by the Sheehan Disability Scales (Leon *et al.* 1997), which asked about interference caused by social phobia in the domains of home management, work, close relationships, and social life during the month in the past year when social phobia was most severe. Each domain was self-rated by respondents on a 0–10 scale reflecting the extent to which social phobia interfered with the respondent's ability to function in the domain. Responses were collapsed into broad categories of Severe Impairment (responses in the range 7–10) and Any Impairment (in the range 1–10). Lifetime treatment and 12-month treatment were assessed specifically for social phobia and more generally for any mental health problem. Use of mental health services was assessed within five sectors: general medical, psychiatry, non-psychiatry mental health specialty, human services, and complementary-alternative.

Statistical analysis

Cross-tabulations were used to estimate prevalence of social fears and social phobia. Tetrachoric factor analysis was used to investigate the number of factors underlying the 14 social fears assessed by the CIDI. Latent class analysis (Goodman, 2002), performed using the iterative-fitting NAG FORTRAN library routine E04UCF (Numerical Approximation Group, 1990), was used to investigate the possibility of non-additivities in the associations among social fears. Selection of the optimal number of latent classes was based on the Bayesian Information Criterion (BIC; Burnham & Anderson, 1998). The program selected random start values and replicated results 25 times to ensure there was no local minimum problem in solutions. The actuarial method (Halli & Rao, 1992), a statistical method for projecting the risk of disorder onset in any given year of life, was used to estimate age-of-onset distributions for four mutually exclusive social phobia subgroups distinguished by their number of social fears. Associations of social phobia and the four subgroups with co-morbid disorders

and sociodemographics were estimated using logistic regression. Conditional probabilities of impairment and treatment-seeking were examined using cross-tabulations. Standard errors and significance tests were estimated using the Taylor series linearization method (Wolter, 1985) implemented in the SUDAAN (Research Triangle Institute, 2002) software system to adjust for weighting and clustering in the NCS-R sample design. The associations of social phobia with multivariate correlates (e.g. the set of three dummy variables representing education) were evaluated using Wald χ^2 tests based on design-corrected coefficient variance-covariance matrices. Statistical significance was determined using two-tailed 0.05-level tests.

Results

Prevalence

As has been reported elsewhere (Kessler *et al.* 2005*a,b*), prevalence estimates (standard error) for lifetime and 12-month DSM-IV social phobia are 12.1% (0.4) and 7.1% (0.3) respectively. Nearly one-quarter (24.1%) of all respondents in the survey reported at least one lifetime social fear, roughly twice the number of respondents with lifetime social phobia (Table 1). The most common lifetime social fears among those considered here are public speaking (21.2%) and speaking up in a meeting or class (19.5%). The least common fears are using a bathroom away from home (5.7%) and writing, eating, or drinking while being watched (8.1%).

Conditional probability of social phobia does not differ strongly across the social fears considered here. By contrast, a monotonic relationship exists between number of social fears and lifetime prevalence of social phobia, with conditional probabilities ranging from a low of 12% among respondents with only one fear to nearly 80% among respondents with all 14 fears considered here. Seventy-one percent of respondents estimated to meet lifetime criteria for social phobia met our operational definition of generalized social phobia by reporting eight or more fears.

Latent structure

Tetrachoric correlations were calculated among the 14 performance and interactional fears in the total sample and found to range from 0.73 to 0.98 with an inter-quartile range of 0.85–0.91 (detailed results available on request). Factor analysis of this matrix found a strong first factor (eigenvalue of 12.3) and a negligible second factor (eigenvalue of 0.2). Item loadings on the first unrotated factor from this analysis ranged from 0.82 (using public bathrooms) to 0.98 (meeting new

Table 1. *Lifetime prevalence of social fears and DSM-IV social phobia (n = 9282)*

	Prevalence of each fear in the total sample		Prevalence of lifetime SO among respondents with each fear		Prevalence of lifetime SO involving each fear in the total sample[a]		Prevalence of each fear among respondents with lifetime SO[b]	
	%	(s.e.)	%	(s.e.)	%	(s.e.)	%	(s.e.)
I. Types of social fears[c]								
Meeting new people	16.8	(0.5)	58.1	(1.9)	9.7	(0.4)	80.5	(1.3)
Talking to people in authority	14.7	(0.4)	59.3	(1.8)	8.7	(0.4)	72.3	(1.4)
Speaking up in meeting/class	19.5	(0.5)	52.9	(1.6)	10.3	(0.4)	85.3	(1.1)
Going to parties	13.4	(0.4)	61.1	(1.7)	8.2	(0.3)	67.6	(1.4)
Public speaking/performance	21.2	(0.5)	50.6	(1.5)	10.7	(0.4)	88.7	(1.0)
Important examination/interview	14.0	(0.4)	58.4	(1.7)	8.2	(0.3)	67.5	(1.8)
Working while being watched	11.8	(0.4)	61.1	(2.6)	7.2	(0.3)	59.4	(1.5)
Entering an occupied room	11.9	(0.4)	62.0	(2.1)	7.4	(0.3)	61.1	(1.7)
Talking with strangers	13.1	(0.4)	61.5	(1.7)	8.1	(0.3)	66.7	(1.7)
Expressing disagreement	12.4	(0.4)	58.6	(1.6)	7.3	(0.3)	60.2	(1.3)
Writing/eating/drinking while being watched	8.1	(0.3)	65.6	(1.8)	5.3	(0.3)	43.9	(1.9)
Using public bathroom	5.7	(0.2)	59.4	(3.0)	3.4	(0.2)	28.1	(1.5)
Dating situation	11.5	(0.4)	63.9	(2.2)	7.3	(0.3)	60.6	(1.6)
Other performance or interactional fear	15.7	(0.5)	58.6	(1.9)	9.2	(0.4)	76.0	(1.8)
Any of the above fears	24.1	(0.6)	50.2	(1.5)	12.1	(0.4)	100.0	(0.0)
II. Number of social fears								
Exactly 1 fear	0.7	(0.1)	12.0	(5.4)	0.1	(0.0)	0.7	(0.3)
Exactly 2 fears	1.4	(0.1)	23.8	(4.6)	0.3	(0.1)	2.7	(0.6)
Exactly 3 fears	1.6	(0.2)	20.2	(3.9)	0.3	(0.1)	2.6	(0.5)
Exactly 4 fears	1.6	(0.2)	39.4	(4.3)	0.6	(0.1)	5.2	(0.8)
Exactly 5 fears	1.6	(0.1)	33.9	(4.8)	0.5	(0.1)	4.5	(0.6)
Exactly 6 fears	1.8	(0.1)	39.4	(4.1)	0.7	(0.1)	5.9	(0.6)
Exactly 7 fears	2.1	(0.2)	43.0	(3.3)	0.9	(0.1)	7.4	(0.7)
Exactly 8 fears	2.2	(0.2)	55.7	(4.2)	1.2	(0.1)	10.3	(0.9)
Exactly 9 fears	2.0	(0.1)	55.8	(4.1)	1.1	(0.1)	9.4	(0.8)
Exactly 10 fears	2.5	(0.2)	55.3	(4.1)	1.4	(0.1)	11.4	(1.0)
Exactly 11 fears	2.0	(0.2)	68.4	(3.6)	1.4	(0.1)	11.4	(1.1)
Exactly 12 fears	1.7	(0.1)	70.0	(4.6)	1.2	(0.1)	10.1	(1.0)
Exactly 13 fears	1.7	(0.1)	80.0	(3.4)	1.3	(0.1)	11.1	(1.0)
Exactly 14 fears	1.1	(0.1)	78.4	(6.4)	0.9	(0.1)	7.3	(0.9)

SO, Social phobia; s.e., standard error.

[a] Percentages in this column equal the product of the percentages in the preceding two columns. For example, 9.7% of respondents in the Part I sample have a lifetime history of social phobia involving a fear of meeting new people.

[b] $n = 1143$.

[c] Social fears assessed included both interactional fears (meeting new people, talking to people in authority, going to parties, entering an occupied room, talking with strangers, expressing disagreement, dating situation) and performance fears (speaking up in meeting/class, public speaking/performance, important examination/interview, working while being watched, writing/eating/drinking while being watched, using public bathroom).

people, speaking up in a meeting/class, public speaking).

A latent class analysis was performed to investigate the possibility that non-additive associations among fears exist that were missed by the factor analysis, which ignores interactions among items. If so, this could lead to more differentiation in the structure of multivariate fear profiles than suggested by the strong unidimensionality found in the factor analysis. A four-class solution provided the best fit to the data among
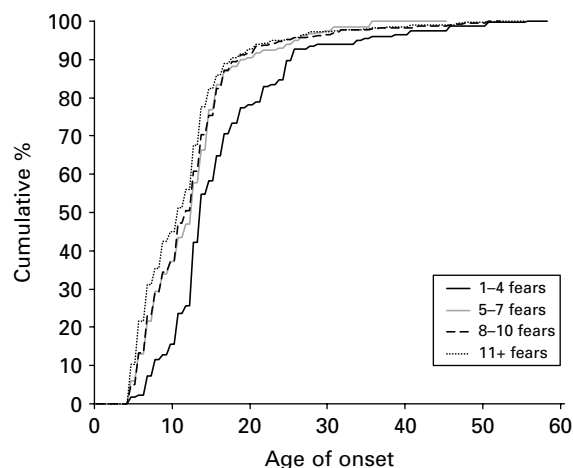
Fig. 1. Age of onset of first social fear in four mutually exclusive social phobia subgroups involving different numbers of social fears. Cumulative age-of-onset distributions were estimated in the subsample of respondents with lifetime social phobia. The distributions differ significantly across the four social phobia subgroups ($\chi^2_3 = 27.4$, $p < 0.001$).

respondents with lifetime social phobia based on a lower value of BIC (15416) than was obtained for other models (15442–15751). Class proportions range from 17.1% of cases in Class 1 to 36.0% of cases in Class 3. The general pattern is for conditional probabilities of individual fears to increase monotonically from Class 1 to Class 4, with the average number of fears among respondents in the classes ranging from 5.2 in Class 1 to 6.9 in Class 2, 9.3 in Class 3, and 12.0 in Class 4 (conditional probability estimates within classes available on request). Of 39 pairwise comparisons across contiguous classes (i.e. each of 13 fears compared in Classes 1 *v.* 2, 2 *v.* 3, and 3 *v.* 4), 85% show the conditional probability of the fear to be higher in the higher class and all but one violation of this pattern are substantively insignificant. The exception is a substantially higher conditional probability of fear of writing, eating, or drinking while being watched in Class 1 (99%) than in Classes 2–4 (25–83%). This finding might be taken to mean that Class 1 defines a unique profile of performance fears. However, fear of going to parties, an interactional fear, also has a high conditional probability in Class 1, arguing against this interpretation. Based on these observations, in conjunction with the strong general pattern of monotonicity in the table and the strong unidimensionality of the factor analysis results, we made no distinction between performance and interactional fears in subsequent analyses.

The finding of nested latent classes in which the predicted probabilities of varied social fears are generally higher in higher classes suggests that the classes are describing different levels of severity along a single dimension. As the four classes were differentiated largely by number of fears, respondents who met CIDI criteria for lifetime social phobia were classified into one of four ordered subgroups based on the number of fears they reported: 1–4 (10.3%), 5–7 (18.6%), 8–10 (31.0%), and 11+ (40.1%). The latter two subgroups feared more than half of the 14 situations assessed and consequently were considered to meet the DSM-IV definition of generalized social phobia, which requires fears about 'most' social situations. The generalized group was further subdivided based on the observation that conditional risk of social phobia increases markedly with 11 or more fears. The non-generalized group was further subdivided to examine the subset of cases falling closest to the diagnostic boundary, with the cut at four or fewer fears chosen to ensure a sufficient sample size in each non-generalized subgroup.

Age-of-onset distributions

Cumulative distributions of age at first fear were found to differ significantly across the four social phobia subgroups ($\chi^2_3 = 27.6$, $p < 0.001$) (Fig. 1). Number of fears is positively associated with early onset of social fear, although the age-of-onset distributions for subgroups with 5–7, 8–10 and 11+ fears are substantively similar in that all have their highest slope between early childhood and mid-adolescence and there are few new onsets after the teen years. By contrast, the subgroup with 1–4 fears has a shallower slope, with fewer childhood onsets and a more gradual accumulation of new cases into the mid-20s.

Separate analysis in the subsample of respondents who report avoidance finds that avoidance is significantly related to number of fears (results not shown, but available on request). Avoidance of social situations is least common in the subgroup with 1–4 fears (67.5%) and increases monotonically with 5–7 (74.8%), 8–10 (79.3%) and 11+ (88.1%) fears ($\chi^2_3 = 26.7$, $p < 0.001$). The age-of-onset distributions for avoidance are very similar to those for fear, with earlier onsets and steeper slopes found for subgroups with more fears. The main difference is that, for all subgroups, the age of first avoidance (median = 12–14 years) is 1–2 years later than the age of first fear (median = 10–13 years).

Recovery distributions

Survival distributions for recovery (2+ years free of symptoms) show that recovery is most likely for social phobia involving 1–4 fears and is somewhat more

rapid for subgroups with fewer fears ($\chi^2_3 = 8.1$, $p = 0.043$) (results not shown, but available on request). Nevertheless, the curves are similar in shape and slope and indicate that, regardless of number of fears, recovery typically takes decades to occur. Only 20–40% of social phobia cases recover within 20 years of onset and only 40–60% recover within 40 years.

Co-morbidity

Nearly two-thirds (62.9%) of respondents with lifetime social phobia involving 1–4 fears meet criteria for at least one other lifetime DSM-IV/CIDI disorder and the proportions are even higher for social phobia with 5–7 fears (75.2%), 8–10 fears (81.5%) and 11+ fears (90.2%). This dose–response pattern is clearest for co-morbidity with other anxiety disorders and weakest for substance use disorders (detailed results available on request). Lifetime social phobia has a significantly elevated odds ratio (OR) with every DSM-IV disorder assessed in the NCS-R (Table 2). This pattern is not due to the confounding effect of time at risk, as the ORs were estimated in logistic regression equations that controlled for age in addition to sex and race-ethnicity. The ORs are highest with other anxiety disorders (3.9–11.9), lower with mood disorders (4.6–6.2), and lowest with impulse-control (2.8–4.4) and substance use (2.8–3.0) disorders. A statistically significant dose–response relationship exists between number of social fears and odds of most co-morbid disorders.

Role impairment

Nearly all respondents (92.6%) with 12-month social phobia reported role impairment as a result of social anxiety, with more than one-third (36.5%) reporting severe impairment in at least one domain of functioning (Table 3). As expected, the greatest impairment and clearest dose–response relationship with number of fears were found in the domains of social life and close relationships. Across role domains, the subgroup with 1–4 fears generally is least impaired while the subgroup with 11+ fears is most impaired. The greatest difference in impairment is typically between social phobia involving 1–4 *versus* 5+ fears.

To evaluate the independent impact of social phobia on impairment, analyses were replicated separately for 12-month pure ($n = 197$) and co-morbid ($n = 482$) cases (detailed results available on request). The dose–response pattern was found to be weaker among pure cases. The proportion of cases reporting severe impairment was also lower among pure than co-morbid cases, suggesting that the association between number of fears and impairment is partly explained by co-morbidity. Nevertheless, 89.9% of pure cases

reported at least some functional impairment in the past 12 months resulting from social phobia, especially in social life (82.4%) and close relationships (71.0%).

Sociodemographic correlates

Sociodemographic correlates of lifetime DSM-IV social phobia include being younger than 60, previously married, and having 'other' employment status (mostly unemployed or disabled) (detailed results available on request). Being Hispanic or non-Hispanic Black is associated with reduced odds of social phobia. While all of these correlates are statistically significant, the ORs are fairly modest in magnitude (0.5–2.2). Furthermore, the association of each sociodemographic variable with social phobia varies significantly with number of fears. Social phobia involving 1–4 fears is more common among males and those of 'other' race-ethnicity (mostly American Indian or Asian). By contrast, social phobia involving a larger number of fears is significantly related to being younger, female, neither Hispanic nor non-Hispanic Black, never or previously married, neither a student nor retired, having less than a college education, an 'other' employment status, and low income. There are no consistent, meaningful differences in the sociodemographic correlates of pure and co-morbid lifetime social phobia.

Treatment

Roughly two-thirds (68.9%) of respondents with lifetime social phobia reported receiving treatment for a mental health problem at some time in their lives (Table 4). Only about one-third (35.2%) of lifetime cases, in comparison, reported ever receiving treatment specifically for social phobia. Respondents with 1–4 fears were seen about equally in general medical (38.8%) and mental health specialty (35.3%) settings, whereas those with 5+ fears were more often seen in mental health specialty (49.5–54.4%) than general medical (35.3–40.1%) settings. Number of fears is positively related to lifetime treatment. The proportions of lifetime cases that ever received treatment for any mental health problem (63.1–71.4%) and for social phobia (28.9–39.2%) increase monotonically across the four subgroups, although subgroup differences are fairly small in substantive terms. Subgroup differences are smaller for 12-month treatment and the association with number of lifetime fears is less clear.

When analyses are restricted to pure (non-co-morbid) cases of social phobia, there is a significant inverse relationship between number of fears and social phobia-specific treatment (detailed results available on request). Among pure lifetime cases

Table 2. *Lifetime co-morbidity (OR)[a] of social phobia and four mutually exclusive social phobia subgroups with other DSM-IV disorders*

	All social phobia		with 1–4 fears		with 5–7 fears		with 8–10 fears		with 11+ fears		
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	χ^2_3
Anxiety disorder											
Panic disorder	4.9*	(4.0–6.0)	3.0*	(1.4–6.2)	3.4*	(2.1–5.5)	3.8*	(2.7–5.3)	7.0*	(5.0–9.8)	12.3**
Agoraphobia without panic	11.9*	(6.8–21.0)	0.8	(0.1–6.7)	5.3*	(1.8–15.7)	8.3*	(4.2–16.5)	22.2*	(12.3–40.1)	26.0**
Specific phobia	5.4*	(4.5–6.5)	3.3*	(2.0–5.3)	4.2*	(3.1–5.7)	5.2*	(3.8–7.1)	6.9*	(5.1–9.2)	7.0
Generalized anxiety disorder	5.2*	(4.2–6.4)	3.7*	(2.3–6.2)	4.6*	(3.2–6.5)	3.8*	(2.7–5.2)	7.2*	(5.3–9.7)	13.5**
Post-traumatic stress disorder[b]	3.9*	(3.1–4.9)	2.5*	(1.4–4.3)	3.0*	(1.8–5.1)	3.1*	(2.2–4.4)	5.3*	(4.0–7.1)	17.2**
Separation anxiety disorder[b]	4.0*	(3.3–4.8)	0.9	(0.4–2.1)	3.1*	(1.9–5.1)	3.8*	(2.6–5.5)	5.7*	(4.8–6.8)	25.9**
Any anxiety disorder[b]	5.9*	(4.8–7.4)	3.1*	(1.8–5.1)	4.5*	(3.3–6.1)	5.6*	(4.4–7.2)	9.1*	(6.1–13.6)	15.8**
Mood disorder											
Major depressive disorder	4.6*	(3.9–5.4)	3.1*	(2.0–4.8)	2.9*	(2.1–4.1)	4.5*	(3.6–5.7)	6.4*	(4.9–8.3)	30.9**
Dysthymia	6.2*	(5.0–7.6)	4.0*	(2.2–7.2)	3.2*	(1.9–5.6)	5.3*	(3.6–7.8)	8.8*	(6.9–11.3)	19.6**
Bipolar disorder (broad)	4.6*	(3.5–6.0)	3.0*	(1.4–6.7)	3.1*	(1.7–5.6)	3.5*	(2.2–5.5)	6.8*	(5.0–9.2)	11.3**
Any mood disorder	4.8*	(4.1–5.6)	3.2*	(2.1–5.0)	3.0*	(2.2–4.2)	4.6*	(3.5–5.9)	7.0*	(5.3–9.3)	28.5**
Impulse-control disorder											
Oppositional-defiant disorder[c]	3.4*	(2.6–4.6)	0.6	(0.2–2.3)	2.3*	(1.5–3.6)	4.1*	(2.8–6.1)	4.3*	(3.1–6.1)	20.2**
Conduct disorder[c]	2.8*	(2.2–3.6)	1.0	(0.3–3.1)	2.0*	(1.1–3.7)	3.1*	(2.0–5.1)	3.4*	(2.3–5.0)	9.2**
Attention-deficit/hyperactivity disorder[c]	4.4*	(3.2–6.0)	1.0	(0.3–3.3)	2.2*	(1.3–3.9)	3.8*	(2.1–7.0)	7.5*	(4.8–11.5)	18.4**
Intermittent explosive disorder	3.5*	(2.9–4.3)	3.3*	(1.8–6.2)	2.3*	(1.4–3.9)	3.0*	(2.2–4.1)	4.8*	(3.7–6.3)	11.1**
Any impulse-control disorder[c]	3.7*	(3.0–4.6)	1.3	(0.7–2.3)	2.5*	(1.7–3.7)	3.3*	(2.3–4.7)	6.2*	(4.5–8.5)	30.7**
Substance use disorder											
Alcohol abuse or dependence[b]	2.8*	(2.3–3.3)	1.6	(0.8–3.0)	3.2*	(2.1–4.6)	2.8*	(2.1–3.7)	3.0*	(2.4–3.9)	4.7
Drug abuse or dependence[b]	3.0*	(2.5–3.7)	1.9	(0.9–4.0)	2.9*	(1.8–4.5)	3.3*	(2.3–4.5)	3.2*	(2.4–4.3)	2.0
Any substance use disorder[b]	2.8*	(2.3–3.3)	1.6	(0.9–2.9)	2.8*	(1.9–4.1)	2.8*	(2.2–3.7)	3.2*	(2.5–4.1)	5.6
Any disorder[2]	6.1*	(5.0–7.5)	2.7*	(1.7–4.3)	4.3*	(2.7–6.6)	6.0*	(4.5–8.0)	12.0*	(7.8–18.4)	24.9**
Exactly one co-morbid disorder[b]	2.6*	(2.0–3.5)	1.8	(1.0–3.2)	2.0*	(1.1–3.7)	3.1*	(2.3–4.3)	3.4*	(2.0–6.0)	4.2
Exactly two co-morbid disorders[b]	4.9*	(3.8–6.3)	3.9*	(2.0–7.8)	3.2*	(1.8–5.7)	5.1*	(3.2–8.3)	7.2*	(4.4–12.0)	5.6
Three or more co-morbid disorders[b]	12.3*	(9.7–15.5)	2.8*	(1.7–4.9)	8.1*	(4.7–13.8)	10.9*	(7.7–15.5)	28.6*	(18.2–45.1)	53.7**
(*n*)	(1143)		(118)		(213)		(354)		(458)		

OR, Odds ratio; CI, confidence interval.

[a] The ORs were estimated in logistic regression models controlling for age at interview, sex, and race-ethnicity. The ORs compare respondents in each group with respondents who have no lifetime history of social phobia. The 3 degrees of freedom χ^2 test compares social phobia subgroups involving 1–4 (*n*=118), 5–7 (*n*=213), 8–10 (*n*=354), and 11+ (*n*=458) fears, indicating whether the association of social phobia with each disorder varies significantly by number of fears. All disorders were defined using DSM-IV criteria without observing hierarchical exclusion rules.

[b] Assessed in the Part II sample (*n*=5692).

[c] Restricted to Part II respondents ages 18–44 (*n*=3197).

* Significant at the 0.05 level, two-sided test.

** Significant difference between the four mutually exclusive social phobia subgroups at the 0.05 level.

(*n*=213), the highest proportion who ever received treatment for social phobia is found in the subgroup with 1–4 fears (25.9%) and decreases monotonically with 5–7 fears (16.6%), 8–10 fears (14.3%), and 11+ fears (8.4%). There is a similar decrease among pure 12-month cases (*n*=197), with a sharp decline in 12-month social phobia treatment between the subgroup with 1–4 fears (15.9%) and all other sub-groups (4.4–7.4%).

Discussion

These results should be interpreted in the context of three notable limitations. First, social phobia was

Table 3. *Role impairment*[a] *in 12-month social phobia and four mutually exclusive social phobia subgroups*

| | All 12-month social phobia | | 12-month social phobia | | | | | | | | | |
| | | | with 1–4 fears | | with 5–7 fears | | with 8–10 fears | | with 11+ fears | | |
	%	(s.e.)	%	(s.e.)	%	(s.e.)	%	(s.e.)	%	(s.e.)	χ^2_3
I. Severe impairment[b]											
Home	10.9	(1.2)	8.7	(3.8)	2.6	(1.0)	10.1	(2.2)	15.0	(1.9)	22.5*
Work	15.4	(1.4)	13.4	(4.0)	12.7	(3.2)	11.5	(2.4)	19.7	(2.1)	6.7
Relationships	22.5	(1.6)	9.1	(3.9)	15.9	(4.0)	24.0	(3.1)	26.9	(3.0)	10.8*
Social life	28.8	(1.4)	8.0	(3.6)	21.9	(4.6)	25.3	(3.3)	38.2	(3.1)	18.3*
Any area	36.5	(1.7)	17.0	(4.5)	30.8	(5.1)	36.6	(3.2)	42.6	(3.5)	14.8*
II. Any impairment[c]											
Home	57.7	(1.9)	61.3	(8.0)	53.0	(5.4)	50.5	(3.1)	63.9	(2.9)	8.3*
Work	70.5	(2.0)	58.8	(5.9)	70.9	(4.6)	67.7	(3.3)	74.9	(2.6)	7.9*
Relationships	80.6	(2.1)	56.3	(7.1)	80.0	(4.9)	77.4	(3.5)	88.2	(1.9)	28.6*
Social life	86.1	(1.9)	64.1	(7.2)	86.0	(3.0)	84.3	(3.4)	92.2	(1.7)	29.0*
Any area	92.6	(1.4)	80.2	(5.6)	93.9	(2.1)	90.1	(2.5)	96.5	(1.2)	16.2*
(*n*)	(679)		(59)		(118)		(207)		(295)		

s.e., Standard error.

[a] Role impairment was assessed for respondents with social phobia who were in episode in the past 12 months. The 3 degrees of freedom χ^2 test compares social phobia subgroups involving 1–4 ($n = 59$), 5–7 ($n = 118$), 8–10 ($n = 207$), and 11+ ($n = 295$) fears, indicating whether impairment varies significantly by number of fears.

[b] Values represent the proportions (standard errors) of respondents reporting severe or very severe impairment (score of 7–10) in each of the four Sheehan Disability Scale domains of functioning.

[c] Values represent the proportions (standard errors) of respondents reporting mild, moderate, severe, or very severe impairment (score of 1–10) in each of the four Sheehan Disability Scale domains of functioning.

* Significant difference between the four mutually exclusive social phobia subgroups at the 0.05 level.

assessed by fully structured lay interviews. Although clinical reappraisal studies have found generally good agreement between CIDI and SCID DSM-IV diagnoses, there is a tendency for CIDI lifetime prevalence estimates, including the social phobia estimates, to be conservative relative to SCID-based estimates (Haro *et al*. 2006). Had we applied the DSM-IV diagnostic hierarchy rules for social phobia, the CIDI prevalence estimates might be lower still. This suggests that the prevalence and societal burden of social phobia is underestimated by the CIDI results presented here. Although clinical diagnoses provide an important benchmark and the modest concordance of SCID and CIDI diagnoses is clearly a limitation of the study, the SCID itself is neither perfectly reliable nor a 'gold standard' measure of social phobia. For these reasons, CIDI–SCID concordance estimates might most appropriately be interpreted as lower-bound estimates of CIDI validity.

Second, respondents were administered the social phobia section if they reported at least one social fear that was excessive and associated with substantial anxiety or avoidance. This is in contrast to the baseline NCS, which required only that respondents report an 'unreasonably strong' social fear to be assessed for social phobia, and thus identified more respondents as having social fears. As the NCS-R screening questions excluded people with milder social fears from further assessment, our estimates of the prevalence of social fears are likely to be underestimates. Third, reports concerning age of onset and lifetime symptoms and treatment were recalled retrospectively. Although a number of strategies were used to reduce recall errors in the NCS-R (Kessler & Ustun, 2004), they probably did not completely remove the differential recall accuracy likely to be associated with length of recall period.

Within the context of these limitations, the prevalence estimates of DSM-IV/CIDI social phobia (lifetime 12.1%, past-year 7.1%) are similar to the prevalence estimates of DSM-III-R social phobia reported a decade ago in the baseline NCS (lifetime 13.3%, past-year 7.9%) (Kessler *et al*. 1994; Magee *et al*. 1996), although higher than the prevalence estimates obtained in more recent epidemiological surveys (Alonso *et al*. 2004; Grant *et al*. 2005). Unlike previous

Table 4. *Lifetime and 12-month treatment*[a] *of social phobia and four mutually exclusive social phobia subgroups*

	All lifetime social phobia		Lifetime social phobia								
			with 1–4 fears		with 5–7 fears		with 8–10 fears		with 11+ fears		
	%	(S.E.)	%	(S.E.)	%	(S.E.)	%	(S.E.)	%	(S.E.)	χ^2_3
I. Lifetime treatment											
General medical[b]	37.5	(1.5)	38.8	(5.0)	35.3	(4.3)	35.0	(2.6)	40.1	(2.8)	221.2*
Any mental health specialty[c]	50.6	(1.5)	35.3	(4.7)	49.5	(5.0)	52.0	(3.1)	54.4	(2.7)	312.1*
Psychiatrist	35.4	(1.7)	24.4	(4.8)	31.5	(4.5)	36.6	(3.3)	39.3	(3.0)	237.4*
Other mental health	36.6	(1.5)	22.9	(3.4)	37.7	(4.0)	36.3	(2.9)	40.3	(2.3)	185.5*
Human services[d]	16.3	(1.0)	13.2	(3.8)	15.6	(2.6)	12.8	(1.7)	20.2	(2.5)	110.0*
CAM[e]	20.9	(1.2)	12.5	(3.0)	18.2	(3.2)	23.0	(2.3)	22.8	(1.9)	359.0*
Any of the above	68.9	(1.6)	63.1	(4.8)	68.9	(4.2)	67.9	(2.6)	71.4	(2.8)	335.6*
Social phobia-specific treatment[f]	35.2	(1.1)	28.9	(3.6)	29.3	(3.6)	35.8	(2.4)	39.2	(2.0)	988.1*
(*n*)	(1143)		(118)		(213)		(354)		(458)		

	All 12-month social phobia		12-month social phobia								
			with 1–4 fears		with 5–7 fears		with 8–10 fears		with 11+ fears		
	%	(S.E.)	%	(S.E.)	%	(S.E.)	%	(S.E.)	%	(S.E.)	χ^2_3
II. 12-month treatment											
General medical[b]	24.9	(1.6)	29.4	(5.9)	22.3	(4.3)	24.9	(4.0)	24.9	(2.3)	159.0*
Any mental health specialty[c]	24.3	(1.4)	17.5	(5.3)	18.7	(3.7)	26.1	(3.9)	26.5	(2.1)	237.6*
Psychiatrist	14.9	(1.4)	10.6	(4.3)	14.0	(3.6)	14.8	(3.2)	16.2	(2.1)	193.0*
Other mental health	18.7	(1.5)	14.8	(4.9)	15.0	(3.7)	20.2	(3.4)	19.7	(1.9)	129.9*
Human services[d]	7.7	(1.0)	6.7	(3.3)	6.1	(1.8)	5.9	(1.7)	9.8	(1.7)	51.9*
CAM[e]	7.4	(0.9)	3.2	(2.3)	11.6	(2.4)	5.0	(1.4)	8.5	(1.8)	83.9*
Any of the above	44.7	(1.8)	44.7	(6.1)	39.2	(5.6)	44.4	(4.3)	47.0	(3.3)	296.8*
Social phobia-specific treatment[f]	16.7	(1.2)	15.8	(4.3)	10.7	(3.8)	18.4	(3.1)	17.9	(1.7)	501.5*
(*n*)	(679)		(59)		(118)		(207)		(295)		

CAM, Complementary-alternative medicine; S.E., standard error.

[a] Values represent the proportions (standard errors) of respondents with social phobia who reported receiving treatment for any mental health problem or for social phobia specifically. A 3 degrees of freedom χ^2 test compares the four social phobia subgroups, indicating whether lifetime or 12-month treatment-seeking varies significantly by number of fears.

[b] Includes primary care doctor, other general medical doctor, nurse, or any other health professional not mentioned elsewhere.

[c] Includes psychiatrist, psychologist, or other mental health professional in any setting; social worker or counselor in a mental health specialty setting; use of a mental health hotline.

[d] Includes religious or spiritual advisor, social worker or counselor in any setting other than a specialty mental health setting.

[e] Includes any other type of healer, participation in an internet support group, or participation in a self-help group.

[f] Refers to treatment obtained specifically for social phobia in any setting.

* Significant at the 0.05 level, two-sided test.

estimates, the NCS-R prevalence estimate was validated against clinician-administered SCIDs, which found that independent clinicians arrive at a prevalence estimate slightly higher than the CIDI estimate. This raises the question why so many prior studies failed to detect the genuinely high proportion of the population with the disorder. Lower estimates in some studies than others (Davidson *et al*. 1994; Stein *et al*. 1994, 1996; Bijl *et al*. 1998; DeWit *et al*. 1999; Wittchen *et al*. 1999; Andrews *et al*. 2001; Alonso *et al*. 2004; Grant *et al*. 2005) may have resulted from differences in methodology or assessment (e.g. variation in the

number and kinds of social situations assessed or in the diagnostic system used) or may reflect genuine differences between countries or cultures in the prevalence of the disorder (Demyttenaere *et al.* 2004). Clinical validation studies of the sort included in the NCS-R would be needed to adjudicate between these possibilities.

We found very few cases of social phobia involving just one or two fears. It is possible that the unusually broad range of social fears assessed in the survey enhanced detection of multiple fears in those who might otherwise have been misclassified as more 'specific' cases. These different fears were strongly correlated in the total sample and the correlations fit a one-factor model in an exploratory factor analysis. A latent class analysis yielded further evidence of unidimensionality in that the four latent classes obtained were found to be largely nested; that is, successively higher classes were characterized by consistently higher conditional probabilities of almost all social fears. These findings replicate a latent class analysis performed in the NCS (Kessler *et al.* 1998) that also found nested latent classes distinguished by number of social fears. Like other community surveys (Furmark *et al.* 2000; Stein *et al.* 2000), these results offer little evidence for distinct fear profiles, such as those that have been hypothesized in the literature to involve performance *versus* interactional situations (Turner *et al.* 1992; Hook & Valentiner, 2002). Although analyses in some clinical samples have found multiple factors underlying social fears, the number and content of the factors has varied considerably across studies (e.g. Safren *et al.* 1999; Baker *et al.* 2002). Future efforts to reconcile these findings will be ideally carried out in community as well as clinical samples, using a range of measures, to provide a clearer structural picture that is independent of instrumentation, setting, and selection effects.

The current study extends previous findings on co-morbidity in social phobia (Kessler *et al.* 1994, 1999; Magee *et al.* 1996; Sonntag *et al.* 2000; Jensen *et al.* 2001; Sareen *et al.* 2001, 2004, 2006; Goodwin & Hamilton, 2003) by including a wider range of co-morbid conditions and by documenting a significant association of co-morbidity with number of social fears. The associations between social phobia and other anxiety, mood, substance use, and impulse-control disorders may be explained in a number of ways (Kraemer *et al.* 2001). Social phobia, which so often has its onset in childhood and therefore precedes most other disorders with which it is co-morbid, may be a direct or indirect risk factor for other mental disorders. The few prospective studies that have examined this issue have tended to find that social phobia is a predictor of later-onset depression (Stein *et al.* 2001; Bittner *et al.*

2004) and substance use (Zimmermann *et al.* 2003). An alternative possibility is that other early-onset mental disorders, such as attention deficit hyperactivity disorder (ADHD) or oppositional-defiant disorder, may increase the likelihood of developing social phobia as well as later disorders. Finally, common causes such as temperament (Kagan *et al.* 1988; Rosenbaum *et al.* 1993; Stein, 1998), personality (Cox *et al.* 2004; Hettema *et al.* 2006), genetic (Kendler *et al.* 1992; Stein *et al.* 1998), or environmental (Kessler *et al.* 1997; Lieb *et al.* 2000; Chartier *et al.* 2001) factors may predispose individuals both to social phobia and to other mental disorders. A shared vulnerability factor of low positive affect (Brown *et al.* 1998), for example, may help to explain the extensive co-morbidity of social phobia with unipolar mood disorders in the present sample and in clinical samples (Brown *et al.* 2001). There is a need for prospective studies to clarify the associations of social phobia with other disorders and to account for the observed dose–response relationship between number of social fears and the extent of co-morbidity. Studies are also needed to determine whether early intervention for social anxiety might prevent the onset of co-morbid conditions related to primary social phobia (Kendall & Kessler, 2002).

As the majority of people with social phobia have co-morbid disorders, it can be asked whether social phobia contributes uniquely to functional impairment. This question is reflected in suggestions by some commentators that social phobia is not associated with 'harmful dysfunction' and therefore is not a mental disorder at all (Wakefield *et al.* 2005). That particular argument – which has been hotly debated (Campbell-Sills & Stein, 2005) – is especially relevant to diagnosable cases with just one or a few social fears, as they fall nearest to the diagnostic threshold and appear less impaired than those with more pervasive fears (Heimberg *et al.* 1990; Kessler *et al.* 1998). To help address this issue, the current survey used the Sheehan Disability Scales to assess the impairment caused by social phobia across several domains of functioning. We found that social phobia, even in the absence of co-morbid conditions, is associated with significantly elevated impairment in multiple domains. Importantly, this holds true for social phobia limited to 1–4 fears, underscoring the significance of even these most circumscribed social phobia cases.

At the same time, consistent with previous research (Stein *et al.* 2000), we found a dose–response relationship between number of social fears and degree of functional impairment. This finding is noteworthy, considering that pure social phobia cases involving a larger number of fears were less likely to receive treatment specifically for this disorder. Together, these data suggest that people who have the greatest need

for social phobia treatment are those least likely to receive it. A possible explanation for these results is that individuals with multiple social fears may be more likely to view social anxiety symptoms as untreatable parts of their personality (i.e. shyness; Bruch *et al.* 1995) than those with a limited number of fears. Another explanation is that these individuals may avoid seeking treatment for emotional problems because of fears of negative evaluation by care providers. This latter possibility is contradicted, however, by our finding that most respondents with social phobia had used non-social-phobia-specific mental health services. This finding implies that health care providers may be missing opportunities to treat social phobia. Careful screening for social phobia among patients presenting with other anxiety, mood, substance use, and impulse-control disorders not only may lead to better detection and treatment of social phobia but also may facilitate treatment of the co-morbid disorders.

In conclusion, the current study provides nationally representative data on the prevalence and correlates of social fears and social phobia in the USA. The results are largely consistent with previous epidemiological studies demonstrating that social phobia is prevalent in the community, co-morbid with other mental disorders, and often not treated. Important novel findings include the demonstration that social phobia, even in the non-co-morbid form, is associated with functional impairment; that social phobia is a unidimensional construct with a dose–response relationship between number of fears and degree of impairment; and that there is an inverse relationship between the severity of social phobia and the likelihood of receiving social phobia-specific treatment.

Declaration of Interest

None.

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