

# Shyness Versus Social Phobia in US Youth

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## KEY WORDS

social phobia, shyness, adolescents, epidemiology, National Comorbidity Survey-Adolescent Supplement

## ABBREVIATIONS

DSM-IV—*Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*

ODD—oppositional defiant disorder

SSRI—selective serotonin-reuptake inhibitor

OR—odds ratio

CI—confidence interval

ADHD—attention-deficit/hyperactivity disorder

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**WHAT'S KNOWN ON THIS SUBJECT:** Psychiatry and the pharmaceutical industry have been criticized for publicizing social phobia to increase pharmaceutical sales, particularly among youth. Moreover, there has been open debate regarding whether the diagnostic entity of social phobia “medicalizes” normal human shyness.



**WHAT THIS STUDY ADDS:** This is the first general population study of youth to demonstrate that social phobia is a disabling psychiatric disorder beyond normal human shyness. In addition, this study provides novel information concerning the plausibility of the medicalization hypothesis for social phobia.

## abstract



**OBJECTIVES:** Scholars and the popular press have suggested that the diagnostic entity of social phobia “medicalizes” normal human shyness. In this study we examined the plausibility of this hypothesis by (1) determining the frequency of shyness and its overlap with social phobia in a nationally representative adolescent sample, (2) investigating the degree to which shyness and social phobia differ with regard to sociodemographic characteristics, functional impairment, and psychiatric comorbidity, and (3) examining differences in rates of prescribed medication use among youth with shyness and/or social phobia.

**METHODS:** The National Comorbidity Survey-Adolescent Supplement is a nationally representative, face-to-face survey of 10 123 adolescents, aged 13 to 18 years, in the continental United States. Lifetime social phobia was assessed by using a modified version of the fully structured World Health Organization Composite International Diagnostic Interview. Adolescents and parents also provided information on youth shyness and prescribed medication use.

**RESULTS:** Only 12% of the youth who identified themselves as shy also met the criteria for lifetime social phobia. Relative to adolescents who were characterized as shy, adolescents affected with social phobia displayed significantly greater role impairment and were more likely to experience a multitude of psychiatric disorders, including disorders of anxiety, mood, behavior, and substance use. However, those adolescents were no more likely than their same-age counterparts to be taking prescribed medications.

**CONCLUSIONS:** The results of this study provide evidence that social phobia is an impairing psychiatric disorder, beyond normal human shyness. Such findings raise questions concerning the “medicalization” hypothesis of social phobia. *Pediatrics* 2011;128:917–925

... through bashfulness, suspicion, and timorousness, will not be seen abroad; loves darkness as life. . . . He dare not come in company for fear of being misused, disgraced, overshoot himself in gestures or speech. . . . He thinks every man observed him . . .

Hippocrates<sup>1</sup>

In the past decade, the field of psychiatry has received increasing criticism for pathologizing normal variations in human emotions and behavior.<sup>2-4</sup> Although public skepticism has been present for a variety of psychiatric disorders, this criticism has been highly evident for the condition of social phobia,<sup>5-7</sup> particularly among children and adolescents.<sup>4-6,8</sup> Moreover, both scholars<sup>2,5,9</sup> and the popular press<sup>10,11</sup> have equated this diagnostic entity to the benign human trait of shyness. Specifically, authors have suggested that the pharmaceutical industry and scientific experts jointly sought to publicize social phobia in pursuit of particular pharmaceutical sales.<sup>5-10,12,13</sup> Those within the scientific community, however, contend that social phobia and shyness are not synonymous; rather, investigators have maintained that social phobia is a persistent, disabling, psychiatric condition.<sup>14-26</sup>

To date, only a minority of studies have examined the characteristics and associated impairment of social phobia in general population samples of youth,<sup>23-25</sup> and none has investigated the degree to which shyness and social phobia differ with regard to these features. The few studies that have investigated the relationship between shyness and social phobia have relied on clinical<sup>27</sup> and/or college student<sup>28,29</sup> samples and therefore might overestimate or underestimate differences between these conditions. In addition, although the notion of medicalization suggests a high rate of prescribed medication use among adolescents with social phobia or shyness, no stud-

ies to date have investigated rates of medication use among these youth. Therefore, the purpose of the present study was threefold: (1) to examine the frequency of shyness and its overlap with social phobia in a nationally representative adolescent sample, (2) to investigate potential differences between shyness and social phobia with respect to sociodemographic correlates, indices of impairment, and psychiatric comorbidity, and (3) to examine rates of prescribed medication use among adolescents with shyness and/or social phobia.

## METHODS

### Sample and Procedures

The National Comorbidity Survey Replication-Adolescent Supplement is a nationally representative, face-to-face survey of 10 123 adolescents, 13 to 18 years of age, in the continental United States.<sup>30-32</sup> Information concerning the sampling strategy, participation rates, and instruments in the National Comorbidity Survey-Adolescent Supplement can be found in greater detail elsewhere.<sup>31,33</sup> The survey was conducted with a dual-frame sample that included a household subsample ( $n = 879$ ) and a school subsample ( $n = 9244$ ).<sup>33</sup> The adolescent response rate for the combined subsamples was 82.9%. Minor differences in sample and population distributions of sociodemographic and school characteristics were corrected with poststratification weighting.<sup>33</sup>

One parent/parent surrogate of each participating adolescent was mailed a self-administered questionnaire to collect information on adolescent mental/physical health and other family- and community-level factors. The full self-administered questionnaire was completed by 6483 parents. All recruitment and consent procedures were approved by the human subjects committees of

Harvard Medical School and the University of Michigan.

### Diagnostic Assessments

Adolescents were administered a modified World Health Organization Composite International Diagnostic Interview 3.0, a fully structured interview of *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV), diagnoses.<sup>34</sup> Lifetime disorders assessed include social phobia and other anxiety disorders (separation anxiety disorder, specific phobia, agoraphobia, panic disorder, and generalized anxiety disorder), mood disorders (major depressive disorder and dysthymic disorder), behavior disorders (oppositional defiant disorder [ODD], conduct disorder, and attention-deficit/hyperactivity disorder [ADHD]), alcohol use disorders (alcohol abuse/dependence), and drug use disorders (drug abuse/dependence). Parents who completed the self-administered questionnaire provided diagnostic information about major depressive disorder, dysthymic disorder, separation anxiety disorder, ADHD, ODD, and conduct disorder. Because previous research has indicated that adolescents may be the most accurate informants concerning their emotional symptoms,<sup>35</sup> only adolescent reports were used to assess diagnostic criteria for mood and anxiety disorders. However, findings from both the parent and the adolescent were combined and classified as positive if either informant endorsed the diagnostic criteria for ODD or conduct disorder, and only parent reports were used for diagnoses of ADHD.<sup>35,36</sup> Definitions of all psychiatric disorders adhered to DSM-IV criteria.

### Social Phobia and Shyness Measures

#### Social Phobia

Twelve social fears, representing interactional, observational, and perfor-

mance situations, were assessed among adolescents. Adolescents met DSM-IV lifetime criteria for social phobia if they endorsed all DSM-IV social phobia criteria, including  $\geq 1$  social fear.<sup>37</sup>

### Shyness

Ratings of adolescent shyness were obtained from adolescents and parents. Adolescents were asked to rate their “shyness around people [their] own age who [they] didn’t know very well” by using a 4-point scale (4 = very, 3 = somewhat, 2 = not very, and 1 = not at all). Parents responded to a parallel 4-point item. For the purposes of the present study, the highest 2 ratings (3 = somewhat and 4 = very) were combined and the lowest 2 ratings (2 = not very and 1 = not at all) were combined, to create a dichotomous variable reflecting the presence versus absence of shyness.

### Clinical Features

#### *Past-Year Impairment and Days Out of Role*

Adolescents who endorsed any social fear in the past 12 months were asked to rate their impairment and disability during the worst month of the past year, in the areas of household chores, school/work ability, family relationships, and social life (Sheehan Disability Scale).<sup>38</sup> The response scale ranged from 0 to 10. An additional item required respondents to estimate the total number of days in the previous year that they were totally unable to carry out their normal activities because of social fear.

#### *Lifetime Treatment Contact for Anxiety Disorders*

For each anxiety disorder, respondents were asked whether they had ever discussed their anxiety with a professional (eg, “Did you ever talk to a medical doctor or other professional about your [anxiety]?”). Types of pro-

fessionals included psychologists, counselors, and other healing professionals. A dichotomous index of anxiety treatment contact was generated by positively scoring cases who endorsed seeking treatment for any anxiety disorder in their lifetimes.<sup>39</sup>

### Prescribed Medication Use

Adolescents were asked to identify any prescription medication they had used because of psychiatric symptoms in the previous year, from a list provided. If adolescents showed difficulty responding, then interviewers asked them to consult medication bottles and/or information was obtained from parents. Medications assessed included antipsychotic agents, antidepressants, anxiolytic agents, stimulants, mood stabilizers/anticonvulsants, and other prescribed medications. Four dichotomous variables of prescribed medication use were created: (1) Any medication included use of  $\geq 1$  medication from the 6 broad medication categories assessed. (2) Any antidepressant included use of  $\geq 1$  of 52 antidepressants, including selective serotonin-reuptake inhibitors (SSRIs), monoamine oxidase inhibitors, tricyclic antidepressants, tetracyclic antidepressants, and atypical antidepressants. (3) Paroxetine included use of the SSRI medication paroxetine. (4) Any other SSRI included use of any of 4 SSRI medications with the exception of paroxetine (ie, citalopram, fluoxetine, fluvoxamine, or sertraline).

### Statistical Analyses

Three mutually exclusive groups were created to allow statistical comparisons across levels of shyness and social phobia: (1) no shyness included adolescents who neither endorsed shyness nor met criteria for lifetime social phobia; (2) shyness included adolescents who endorsed shyness but did not meet criteria for lifetime social phobia; and (3) social phobia included

adolescents who met criteria for lifetime social phobia (with or without shyness). Because diagnoses of social phobia were derived solely from adolescent informants, adolescent reports of shyness also were used, to maintain methodologic consistency across the 3 comparison groups. Statistical analyses were completed with SPSS 17.0 (SPSS Inc, Chicago, IL) and accounted for the complex survey design. General linear models and multivariate logistic regression analyses were used to examine comorbidity, clinical impairment, and rates of medication use for each group; all models controlled for gender, age, and other psychiatric disorders simultaneously. Confidence intervals (CIs) and SEs of adjusted odds ratios (ORs)/contrast estimates were calculated on the basis of design-adjusted variances. The design-adjusted Wald  $\chi^2$  test or F test was used to examine differences across groups, and statistical significance was based on 2-sided tests ( $P < .05$ ).

## RESULTS

### Frequency of Shyness and Prevalence of Social Phobia

The lifetime frequency of shyness and the lifetime prevalence of social phobia are presented overall and according to sociodemographic characteristics in Table 1. As shown, 62.4% of parents reported that their adolescents were shy, whereas a more-moderate 46.7% of adolescents thought that they were shy. In contrast, only 8.6% of adolescents met DSM-IV criteria for social phobia at some point in their lifetime. The proportion of lifetime social phobia among youth with and without shyness are presented in Fig 1. As shown, among all youth who endorsed shyness, only 12.4% met criteria for lifetime social phobia. Similarly, 10.6% of adolescents who were considered shy by their parents met criteria

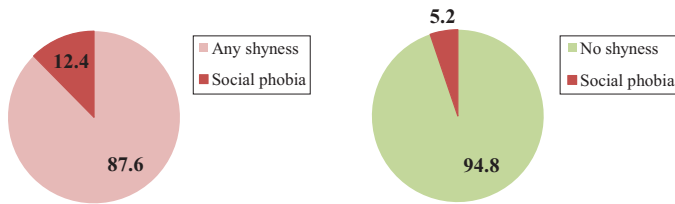
**TABLE 1** Frequency of Shyness and Prevalence of Social Phobia According to Adolescent Gender and Age

Shyness/Social Phobia	Rate, Estimate ± SE, %					
	Male	Female	13–14 y	15–16 y	17–18 y	Total
Any shyness, parent report	59.7 ± 1.4	65.3 ± 1.1 <sup>a</sup>	66.2 ± 1.5 <sup>b</sup>	63.3 ± 1.5	54.8 ± 2.0	62.4 ± 1.1
Any shyness, adolescent report	43.4 ± 1.0	50.1 ± 1.0 <sup>a</sup>	46.3 ± 1.4	47.0 ± 1.3	46.6 ± 2.0	46.7 ± 0.7
Lifetime social phobia, adolescent report	7.9 ± 0.6	9.2 ± 0.7	6.3 ± 0.7	9.6 ± 0.9 <sup>c</sup>	10.4 ± 1.0 <sup>c</sup>	8.6 ± 0.5

<sup>a</sup> Significantly greater frequency than male subjects ( $P < .05$ ).

<sup>b</sup> Significantly greater frequency than 17- to 18-year-old subjects ( $P < .05$ ).

<sup>c</sup> Significantly greater prevalence than 13- to 14-year-old subjects ( $P < .05$ ).



**FIGURE 1**

Proportion of adolescents with lifetime social phobia among those with ( $n = 4749$ ) and without ( $n = 5374$ ) shyness according to adolescent reports.

for social phobia (results not shown). Among the youth who were not considered shy by their own reports or their parents' reports, 5.2% and 5.5%, respectively, met criteria for social phobia (parent-reported shyness results not shown).

Also as displayed, gender and age effects seemed to vary for shyness versus social phobia. According to both parent and adolescent reports, shy-

ness was more common among female adolescents than among male adolescents (parent report: 65.3% vs 59.7%; Wald  $F_1 = 14.80$ ;  $P < .05$ ; adolescent report: 50.1% vs 43.4%; Wald  $F_1 = 24.07$ ;  $P < .05$ ). However, adolescent gender had no significant effect on the prevalence of social phobia. Similarly, whereas shyness was more common in the youngest age group, relative to the oldest adolescent age group (par-

ent report: 66.2% vs 54.8%; Wald  $F_2 = 13.16$ ;  $P < .05$ ), or remained consistent across age groups (adolescent report), the prevalence of social phobia increased with age (10.4% [17–18 years] and 9.6% [15–16 years] vs 6.3% [13–14 years]; Wald  $F_2 = 10.45$ ;  $P < .05$ ).

### Psychiatric Comorbidity According to Adolescent Group

The weighted rates, ORs, and CIs of adolescent psychiatric disorders are presented for each of the 3 mutually exclusive subgroups in Table 2. As shown, adolescents with social phobia were consistently more likely to experience a variety of psychiatric disorders, relative to the other adolescent groups. Relative to adolescents with shyness, adolescents with social pho-

**TABLE 2** Rates of Lifetime Psychiatric Disorders Among Adolescents According to Presence of Shyness or Social Phobia

Disorder	Rate, Estimate ± SD, %			OR (95% CI) <sup>a</sup>		
	No Shyness	Shyness	Social Phobia	Shyness vs No Shyness	Social Phobia vs No Shyness	Social Phobia vs Shyness
Anxiety disorders	19.5 ± 1.0	25.2 ± 1.1	57.9 ± 2.2	1.35 (1.02–1.79)*	3.77 (2.51–5.66)*	2.79 (1.94–4.00)*
Specific phobia	11.4 ± 0.7	14.9 ± 1.0	37.9 ± 2.4	1.33 (0.92–1.92)	2.62 (1.97–3.47)*	1.97 (1.31–2.96)*
Agoraphobia	0.8 ± 0.3	3.3 ± 0.5	10.9 ± 2.0	5.01 (2.30–10.91)*	12.92 (4.82–34.60)*	2.58 (1.38–4.83)*
Panic disorder	1.6 ± 0.2	2.1 ± 0.3	7.4 ± 1.5	1.41 (0.71–5.13)	2.45 (1.17–5.13)	1.74 (0.85–3.57)
Posttraumatic stress disorder	3.6 ± 0.5	3.0 ± 0.5	11.4 ± 1.4	0.60 (0.31–1.16)	1.17 (0.65–2.10)	1.96 (1.03–3.74)
Generalized anxiety disorder	2.9 ± 0.5	3.0 ± 0.5	10.3 ± 1.5	0.65 (0.38–1.14)	1.47 (0.74–2.91)	2.24 (1.22–4.12)*
Separation anxiety disorder	4.8 ± 0.5	6.2 ± 0.5	21.9 ± 2.3	1.18 (0.81–1.72)	3.32 (2.07–5.31)*	2.82 (1.78–4.47)*
Mood disorders	9.8 ± 0.6	10.2 ± 0.8	24.2 ± 2.1	1.14 (0.86–1.51)	1.81 (1.18–2.79)*	1.59 (0.86–2.89)
Major depression	11.3 ± 0.7	11.0 ± 0.8	31.4 ± 1.8	1.13 (0.85–1.50)	2.32 (1.44–3.75)*	2.06 (1.16–3.65)*
Dysthymia	3.5 ± 0.4	2.1 ± 0.3	8.7 ± 1.0	0.55 (0.34–0.88)	0.61 (0.30–1.23)	1.12 (0.58–2.16)
Behavior disorders	21.4 ± 1.5	16.4 ± 1.2	35.5 ± 4.2	0.72 (0.57–0.90)*	1.62 (1.08–2.45)*	2.26 (1.46–3.51)*
ODD	10.2 ± 1.0	7.1 ± 0.7	20.4 ± 3.7	0.74 (0.54–1.01)	1.46 (0.95–2.26)	1.99 (1.23–3.22)*
Conduct disorder	11.9 ± 1.2	8.2 ± 0.8	21.8 ± 4.5	0.76 (0.54–1.07)	1.35 (0.79–2.29)	1.77 (1.00–3.16)
ADHD	9.9 ± 0.9	8.4 ± 0.8	12.7 ± 2.2	1.01 (0.76–1.34)	1.01 (0.54–1.89)	1.01 (0.57–1.78)
Substance use disorders	12.3 ± 0.8	8.0 ± 0.9	23.4 ± 3.0	0.55 (0.41–0.74)*	1.27 (0.69–2.32)	2.30 (1.29–4.11)*
Alcohol use disorders	7.1 ± 0.5	4.4 ± 0.5	13.3 ± 1.9	0.57 (0.37–0.87)*	0.71 (0.44–1.14)	1.24 (0.77–1.99)
Drug use disorders	9.3 ± 0.8	6.0 ± 0.7	21.0 ± 3.1	0.53 (0.37–0.75)*	1.73 (0.86–3.47)	3.27 (1.72–6.21)*

<sup>a</sup> Models were adjusted for adolescent gender, age, and comorbid anxiety, emotional, and behavior disorders (except the disorder of interest).

\* Statistically significant at  $P < .05$ .

bia were more likely to be affected by anxiety disorders (OR: 2.79 [95% CI: 1.94–4.00]), major depressive disorder (OR: 2.06 [95% CI: 1.16–3.65]), ODD (OR: 1.99 [95% CI: 1.23–3.22]), and drug use disorders (OR: 3.27 [95% CI: 1.72–6.21]). Comparisons of adolescents with social phobia with adolescents with no shyness generated a similar pattern of results.

Statistical comparisons of the social phobia and shyness groups with the no-shyness group generated results that varied in direction as a function of the disorder of interest. Similar to adolescents with social phobia, adolescents with shyness were more likely to evidence agoraphobia (OR: 5.01 [95% CI: 2.30–10.91]), relative to adolescents in the no-shyness group. Unlike adolescents with social phobia, however, who showed positive associations with behavior and substance use disorders, adolescents with shyness were less likely to be affected with these disorders (behavior disorders: OR: 0.72 [95% CI: 0.57–0.90]; substance use disorders: OR: 0.55 [95% CI: 0.41–0.74]).

### Clinical Impairment, Professional Treatment, and Medication Use According to Adolescent Group

Mean  $\pm$  SE values and weighted rates of indicators of impairment are shown for each adolescent group in Table 3. As displayed, comparisons of clinical indicators according to group showed that adolescents with social phobia demonstrated higher levels of impairment, compared with adolescents in both the no-shyness and shyness groups. Relative to adolescents with shyness, adolescents with social phobia had greater impairment in the areas of school/work (mean:  $4.32 \pm 0.24$  vs  $2.68 \pm 0.15$ ;  $P > .05$ ), family relationships (mean:  $2.23 \pm 0.27$  vs  $1.22 \pm 0.12$ ;  $P < .05$ ), and social life (mean:

**TABLE 3** Clinical Impairment and Medication Use Among Adolescents According to Presence of Shyness or Social Phobia

Outcome	Value, Mean $\pm$ SE <sup>a</sup>			Days			Proportion, Estimate $\pm$ SE, %			Contrast Estimate $\pm$ SE			OR (95% CI) <sup>b</sup>		
	No Shyness	Shyness	Social Phobia	No Shyness	Shyness	Social Phobia	No Shyness	Shyness	Social Phobia	No Shyness	Shyness vs No Shyness	Social Phobia vs No Shyness	Shyness vs No Shyness	Social Phobia vs No Shyness	Social Phobia vs Shyness
Past-year impairment (adolescent report)															
Chores	0.88 $\pm$ 0.12	0.98 $\pm$ 0.12	1.45 $\pm$ 0.25	—	—	—	—	—	—	—	0.10 $\pm$ 0.18	0.57 $\pm$ 0.26	0.47 $\pm$ 0.27	—	—
School/work ability	2.42 $\pm$ 0.16	2.68 $\pm$ 0.15	4.32 $\pm$ 0.24	—	—	—	—	—	—	—	0.26 $\pm$ 0.20	1.91 $\pm$ 0.32*	1.65 $\pm$ 0.31*	—	—
Family relationships	1.20 $\pm$ 0.15	1.22 $\pm$ 0.12	2.23 $\pm$ 0.27	—	—	—	—	—	—	—	0.01 $\pm$ 0.20	1.03 $\pm$ 0.28*	1.01 $\pm$ 0.28*	—	—
Social life	1.82 $\pm$ 0.17	2.80 $\pm$ 0.14	4.41 $\pm$ 0.29	—	—	—	—	—	—	—	0.88 $\pm$ 0.24*	2.48 $\pm$ 0.36*	1.61 $\pm$ 0.32*	—	—
Days out of role	0.91 $\pm$ 0.45	1.34 $\pm$ 0.33	3.86 $\pm$ 1.49	—	—	—	—	—	—	—	0.43 $\pm$ 0.54	2.95 $\pm$ 1.64	2.52 $\pm$ 1.51	—	—
Lifetime treatment	—	—	—	6.6 $\pm$ 0.6	7.2 $\pm$ 0.8	22.7 $\pm$ 2.4	—	—	—	—	—	—	—	—	—
Anxiety treatment	—	—	—	6.4 $\pm$ 0.8	6.4 $\pm$ 0.6	12.1 $\pm$ 1.4	—	—	—	—	—	—	—	—	—
Any medication	—	—	—	3.5 $\pm$ 0.5	3.7 $\pm$ 0.4	7.5 $\pm$ 1.2	—	—	—	—	—	—	—	—	—
Any antidepressant	—	—	—	0.6 $\pm$ 0.1	0.9 $\pm$ 0.2	2.3 $\pm$ 0.9	—	—	—	—	—	—	—	—	—
Paroxetine	—	—	—	2.0 $\pm$ 0.4	2.0 $\pm$ 0.3	4.9 $\pm$ 1.0	—	—	—	—	—	—	—	—	—
Any other SSRI	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

<sup>a</sup> Impairment ratings were limited to adolescents who endorsed  $\geq 1$  fear of social situations in the past year ( $N = 2487$ ); impairment scores ranged from 0 to 10.

<sup>b</sup> Models were adjusted for adolescent gender, age, and comorbid anxiety, emotional, and behavior disorders.

<sup>c</sup> Statistically significant at  $P < .05$ .



4.41 ± 0.29 vs 2.80 ± 0.14;  $P < .05$ ). Parallel results were observed when adolescents with social phobia were compared with adolescents with no shyness.

Table 3 also presents estimates of rates of professional treatment and prescribed medication use across social phobia and shyness groups. Although adolescents with social phobia showed significantly higher levels of impairment than did adolescents with shyness, they were no more likely to obtain professional treatment. Notably, nearly 80% of adolescents with social phobia failed to seek or to obtain professional treatment for their anxiety. Also as shown, rates of prescribed medication use were systematically low across groups; 2.3% of adolescents with social phobia and 0.9% of adolescents with shyness used paroxetine. Statistical comparisons also indicated that adolescents with social phobia were no more likely to be using any prescribed medication, any antidepressant, paroxetine, or any other SSRI, relative to both other adolescent groups. In the same manner, adolescents with shyness were no more likely to be using prescribed medications, compared with adolescents with no shyness.

## DISCUSSION

On the basis of both descriptive and analytic examination, the results of the present study provide convergent evidence that social phobia is not simply shyness. In contrast to the high frequency of shyness observed among US adolescents, social phobia affected a minority of youth in this sample and only a fraction of those who identified themselves as shy. Perhaps most important, adolescents who met criteria for social phobia displayed significantly greater role impairment and were more likely to experience a broad array of psychiatric disorders, includ-

ing disorders of anxiety, mood, behavior, and substance use, relative to adolescents who were characterized as shy. However, these adolescents were no more likely than their same-age counterparts to be taking prescribed medications.

Our results show that nearly one-half (ie, 46.7%–62.4%) of adolescents in the US population may be considered shy, according to their own reports or their caregivers' reports. Consistent with these findings, other investigators have found that >40% of high school-aged and/or college-aged students rate themselves as shy.<sup>29,31–42</sup> In contrast, and in accord with previous work,<sup>26,32,37</sup> rates of social phobia were considerably lower; the condition affected 8.6% of youth in their lifetime. Moreover, only 10% to 12% of shy adolescents also fulfilled diagnostic criteria for social phobia. Such findings strongly replicate previous investigations involving college students, which found fairly low rates of social phobia among individuals who are shy.<sup>28,29</sup> In addition, a nontrivial proportion of youth who met the criteria for social phobia were not considered shy by either informant. Such results contest a direct linear relationship between shyness and social phobia and suggest that, for some adolescents, the presence of social phobia might be independent of shyness.

Observed differences in functional impairment and rates of psychiatric disorders among adolescent groups provide further support for conceptualizing shyness and social phobia as distinct constructs. Relative to adolescents with either shyness alone or no shyness, adolescents with social phobia displayed significantly higher levels of impairment in multiple domains, including school/work ability, social life, and family relationships. In contrast, adolescents with shyness alone were no more likely than youth who

were not shy to exhibit impairment in the majority of these domains. Similarly, consistent with previous studies involving college students and/or clinically referred young adults,<sup>27,28,45</sup> adolescents with social phobia were significantly more likely to experience a multitude of psychiatric disorders, relative to each of the other adolescent groups. Further highlighting their differences, comparisons with adolescents in the no-shyness group yielded some results that varied in direction for the shyness and social phobia groups. For instance, relative to adolescents who failed to endorse shyness, adolescents with social phobia were more frequently affected by behavior and substance use disorders, whereas adolescents with shyness were less likely to present with these disorders. In agreement with these results, a number of studies have revealed strong associations between social phobia and behavior and/or substance use disorders,<sup>44–48</sup> whereas shyness in early childhood has been found to reduce the risk of subsequent behavior and substance use problems.<sup>49–53</sup>

Shyness and social phobia also showed unique sociodemographic patterns, which supports the value of discriminating between these phenomena. In line with some previous studies of youth,<sup>54,55</sup> more female adolescents than male adolescents displayed shyness across informant reports. In contrast, no gender effects were observed for social phobia, which was equally distributed across male and female youth. Although our failure to detect gender differences in the prevalence of social phobia counters some previous studies of youth,<sup>23,25</sup> other investigations have suggested that the female preponderance of social phobia may be evident only for more pervasive forms of the disorder.<sup>37,45,56</sup> Similarly, whereas shyness was most common

among adolescents in the youngest age group (by parent reports) or showed no variations with age (by adolescent reports), social phobia was significantly more prevalent among older adolescents. The lack of nationally representative studies examining shyness and social phobia in this age cohort makes comparisons with previous research difficult; however, a study involving college student and clinically referred participants also observed varying sociodemographic characteristics for individuals with shyness versus social phobia.<sup>27</sup>

In addition, the estimates of prescribed medication use in this study counter ideas concerning the medicalization of shyness that have been proposed.<sup>5–10,12</sup> Contrary to the notion of medicalization, which would predict higher rates of prescribed medication use (in particular, paroxetine use) among adolescents with social phobia or shyness, we found no differences in the rates of prescription medication use across adolescent subgroups. Only 2.3% of youth with social phobia and 0.9% of youth with shyness reported using any paroxetine, rates that are no different from the rate observed among adolescents without these characterizations. It also is important to note that the results of this study represent prescription medication use patterns before Food and Drug Administration directives that might have reduced SSRI prescriptions for youth.<sup>57</sup> Therefore, the suggested efforts of pharmaceutical companies (and the medical profes-

sion) to enhance prescription sales among youth with shyness or social phobia<sup>5–10,12</sup> appear to have had a negligible effect.

Several study limitations are notable. First, it was necessary to use a number of abbreviated measures in the National Comorbidity Survey-Adolescent Supplement, to reduce assessment burden and to ensure that costs were not prohibitive. For example, the measure of shyness used in the present study was limited to an index of the presence versus absence (rather than the severity) of shyness. Consequently, because no continuous measure of shyness severity was available, it was not possible to examine the degree to which social phobia approximates a form of extreme shyness. Despite this limitation, the rates of shyness revealed among adolescents were fairly consistent across multiple informants and were strikingly similar to the rates observed in other studies,<sup>29,40–42,58</sup> which provides support for the reliability of this index. Furthermore, the magnitude and direction of relationships between shyness and other key constructs were comparable to the results of several previous studies,<sup>49,50,53–55</sup> indicating robust nomologic validity. Second, data on several indices of impairment used in the present study were available only for youth who reported social fears in the past year, and findings might not reflect impairment among youth who failed to report recent social fears. Additional research involving more-comprehensive instruments and as-

essment periods should provide further support for the current results.

## CONCLUSIONS

Importantly, this study is the first to examine the rate of shyness and its overlap with social phobia in a nationally representative sample of US adolescents. In addition, it is the first to investigate the degree to which features of these constructs differ in a general population sample of youth. Taken together, the results of the present study emphasize social phobia as an impairing psychiatric disorder, beyond normal human shyness. Such findings raise critical questions concerning the plausibility of the medicalization hypothesis. Although many adolescents with social phobia demonstrate marked impairment, results suggest that few ever seek or obtain professional help. Persistent claims that dispute the severity of this condition among youth likely will do little to alter their course.

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**GETTING TO AUSTRALIA:** *One of the enduring mysteries of our species is how and when we populated the continents. The traditional model is that ancestors of modern humans migrated out of Africa in a single wave. Once in Arabia, one group headed north toward Europe to become the ancestors of all Europeans. A separate group headed east to become the ancestors of East Asians. The ancestors of the Australian aborigines split off from this group and settled in Australia. However, as reported in The Wall Street Journal (World: September 23, 2011), recent genetic evidence suggests otherwise. Researchers compared the genomes of two West Africans, three Han Chinese, and two Europeans with the genes found in a 100 year old lock of hair from an Aborigine man who had lived in a remote part of Australia and therefore unlikely to have any European genes. Their surprising find suggests that Aborigine ancestors were part of an early modern human exodus from Africa but split off from this group approximately 70,000 years ago. The ancestors of modern Europeans and Asians split from each other approximately 30,000 years ago. Once the Aborigine ancestors settled in Australia around 50,000 years ago, no other populations arrived. If this is correct, Aborigines would represent one of the oldest continuous populations outside Africa. Another conclusion is that the Aborigine ancestors were remarkably resourceful. To reach Australia, not only would they have had to make use of boats but would have had to use the boats without being able to see their destination. Water levels were lower then. Explorers would not have been able to see the Australian landmass before embarking on their journey. While provocative, this study is unlikely to be the final answer to how and when modern humans left Africa. As gene-sequencing technology continues to progress, more studies such as this will help us learn more about who we are and where we came from.*

Noted by WVR, MD