11-2003

Alcohol and Anxiety: Subtle and Obvious Attributes of Abuse in Adults with Social Anxiety Disorder and Panic Disorder

Lindsay S. Ham
University of Nebraska-Lincoln, lham@uark.edu

Debra A. Hope
University of Nebraska-Lincoln, dhope1@unl.edu

Alcohol and Anxiety: Subtle and Obvious Attributes of Abuse in Adults with Social Anxiety Disorder and Panic Disorder

Lindsay S. Ham and Debra A. Hope

Department of Psychology, University of Nebraska–Lincoln, Lincoln, Nebraska, USA

Corresponding author – Debra A. Hope, Department of Psychology, University of Nebraska–Lincoln, Lincoln, NE 68588-0308, email dhopel@unl.edu

Abstract

Previous research has found a relation between social anxiety disorder and alcoholism, but recent work found no differences in drinking levels among socially anxious individuals, dysthymics, and normal controls. Using a more sophisticated measure of substance abuse may further explicate the relation between social anxiety and drinking. We examined aspects of substance abuse in treatment-seeking individuals with social anxiety disorder or panic disorder (psychiatric control group) as well as nondisordered individuals (normal control group). We used the Substance Abuse Subtle Screening Inventory–3 because it includes both face valid and subtle items to control for social desirability. Contrary to the hypotheses, there were few obvious or subtle aspects of substance abuse significantly greater for individuals with social anxiety disorder than those with panic disorder or normal controls. Implications for understanding the social anxiety–alcohol relationship, assessment of substance abuse in socially anxious populations, and the construct of social anxiety are discussed.

Keywords: social phobia, alcohol, anxiety, substance abuse screening, substance abuse

Introduction

According to Kessler et al. (1994), approximately 1 in 4 respondents have a lifetime history of an anxiety disorder. In addition to this high prevalence, an anxiety disorder may be further complicated with an alcohol use disorder. According to Regier et al. (1990), those

diagnosed with an anxiety disorder had about a 50% increase in the odds of being diagnosed with an alcohol use disorder compared with the rest of the sample. Furthermore, Chambless et al. (1987) found that 40% of inpatient alcoholics had a lifetime anxiety disorder, which is significantly higher than inpatient alcoholics diagnosed with the more widely recognized major depression. It appears that in many cases excessive alcohol use begins after the individual experiences anxious symptoms (e.g., Chambless et al., 1987); therefore, the individual may be using alcohol to alleviate the tension and discomfort resulting from the anxiety disorder (e.g., Quitkin et al., 1972).

Although it seems that anxiety is related to alcohol use disorders, research has shown some differences among specific anxiety disorders and the alcohol use disorders. For instance, individuals with a diagnosis of simple phobia (now called "specific phobia") do not appear to have a risk of comorbid alcohol use disorders above the prevalence of alcohol abuse or dependence in community samples (Himle and Hill, 1991). Conversely, social anxiety disorder (previously labeled "social phobia") and panic disorder have been associated with an increased risk of alcohol dependence and/or problematic alcohol use (Kushner et al., 2000). Thus, diagnostic specificity may be useful in examining the anxiety-alcohol relation.

Recent work has found social anxiety disorder to be the third most common psychiatric disorder with a lifetime prevalence of 13.3% (Kessler et al., 1994). The onset of social anxiety disorder is generally early, following a chronic course. Social anxiety disorder can cause significant vocational, academic, and social impairment, and often occurs with other psychological problems (Davidson et al., 1993; Sanderson et al., 1990).

Alcohol problems and social anxiety appear to be related. Many studies have found that there are higher prevalence rates of alcoholism within samples of socially anxious individuals, which are at least twice as likely to have had alcohol problems as community samples (Kushner et al., 1990, 2000). Several studies have found comorbid alcohol diagnoses in 16–36% of individuals diagnosed with social anxiety disorder (Davidson et al., 1993; Holle et al., 1995; Van Ameringen et al., 1991) compared with a lifetime prevalence for the general population of 11–16% (Van Ameringen et al., 1991). Many studies have found higher rates of socially anxious individuals in alcoholic populations compared with normal control and community samples. Among the alcoholic inpatients sampled by Chambless et al. (1987), social anxiety disorder was the most common lifetime anxiety disorder diagnosis. In a study of patients in an alcoholism treatment unit, 25% of men and 17% of women were diagnosed with social anxiety disorder, and an additional 35% of men and 28% of women rated "borderline" for social anxiety disorder (Mullaney and Trippett, 1979). In a multicenter study of alcohol-dependent individuals in Germany, 13.7% of patients were diagnosed with social anxiety disorder, the third most common diagnosis among the patients, after specific phobias and major depressive episodes (Schneider et al., 2001).

Although the correlation between social anxiety and alcohol use disorders is well-established, findings regarding social anxiety and level of alcohol use seem to contradict this correlation. Recent work found that those with social anxiety disorder did not have higher levels of "typical" drinking than either participants with dysthymia or normal controls as reported in a structured diagnostic interview (Ham et al., 2002). There were no differences

among the three groups in alcohol consumption, which seems inconsistent with prior research finding more alcohol use disorder diagnoses among individuals with social anxiety disorder. One explanation for this finding may be that a subset of socially anxious individuals does not drink owing to fears of alcohol's disinhibiting effects (e.g., Bruch et al., 1992), whereas other socially anxious individuals drink as a method of self-medication. On the other hand, it is possible there were difficulties in assessing substance use in previous work that used self-reported drinking levels and other face valid measures.

Hasin and Carpenter (1998) conducted a study in which both community and clinical samples were asked a series of questions regarding their "usual" drinking and whether they had "trouble answering" such questions. Participants were also asked whether they had experienced changes in their drinking over the past year that made it hard to answer questions about their usual drinking. Of the community participants, 29.4% reported trouble answering, with age, gender, heavier drinking, and a DSM-IV diagnosis of alcohol dependence being significantly related to trouble answering. Of the clinical participants, 50.8% reported trouble answering; a DSM-IV diagnosis of alcohol dependence was the only variable significantly related. With nearly one third of the community sample and half of the clinical sample having difficulties answering the questions, it seems that such questions may not provide accurate indications of alcohol use. Some of this inaccuracy may be due to difficulties with memory or changes in one's drinking that make it difficult to estimate usual drinking. However, some inaccuracy may be due to a desire to present oneself in a positive manner. Although a review of the literature has revealed that alcohol abusers' self-reports of drinking are generally honest, virtually all studies find a proportion of alcohol abusers whose reports are inaccurate (Sobell and Sobell, 1990). A social desirability response bias may be present in many individuals who feel that alcohol abuse is not a socially desired behavior. Anxious patients, particularly socially anxious ones, with a high need for social approval may minimize their report of alcohol use. It may be less socially acceptable for individuals seeking treatment for anxiety to admit abusing alcohol than to describe the presence of an anxiety disorder (Cox et al., 1993). However, self-report alcohol measures that include an assessment of social desirability can correctly identify individuals with problematic drinking who attempt to hide their problems (Otto et al., 1988). Therefore, analysis of the relation between anxiety and alcohol abuse with more sophisticated assessment of substance abuse may further explicate the social anxiety–alcohol use relation.

The Substance Abuse Subtle Screening Inventory–3 (SASSI-3; Lazowski et al., 1998) contains subscales examining both subtle and obvious aspects of substance abuse, with not all items being face valid to help control for social desirability. In addition, the SASSI-3 includes a defensiveness subscale that aids in identifying those who are not willing to endorse problems and shortcomings. The goal of the instrument's creators were to identify those who have a high probability of having a diagnosable substance use disorder so that they may be further evaluated regardless of their willingness to report relevant symptoms openly. This goal appears to have been met, as the accuracy rates for the original SASSI are about the same whether the respondents are being honest about their substance use or are attempting to conceal or deny a problem (Piazza et al., 2000). The combination of the SASSI

and self-report was even better than the SASSI alone, successfully screening 95% of pregnant women, missing none of the known cocaine users or alcoholics, and minimizing the need for urine toxicology (Horrigan and Piazza, 1999). There have been two revisions of the SASSI to reduce classification error rate further and eliminate two items with potentially objectionable content (Lazowski et al., 1998). Thus, the SASSI-3 may provide a more sophisticated and accurate assessment of alcohol use disorders in a clinical population than a merely face valid measure.

Because the SASSI-3 is widely used in clinical settings, a secondary aim of this research was to further evaluate the usefulness of the SASSI-3 in a clinical sample. The current study focused on aspects associated with substance abuse rather than on screening for dependence because the population examined does not consist of individuals seeking treatment for a substance use disorder but for an anxiety disorder. By examining individuals seeking treatment for anxiety disorder, this may provide information on the utility of the SASSI-3 scales in examining substance abuse in clinical populations other than those seeking treatment for substance-related disorders.

To help examine whether findings regarding the association between social anxiety and alcohol use are specific to social anxiety disorder, the design of the present study included both a matched normal control group and a psychiatric control group of individuals seeking treatment for panic disorder with or without agoraphobia. Individuals diagnosed with panic disorder were chosen as the psychiatric control group because both social anxiety disorder and panic disorder are anxiety disorders with elevated rates of co-occurring alcohol use disorders relative to community controls (Kushner et al., 2000), but the two disorders may differ in the rate, impact, and order of onset of alcohol use as described below.

Most research has suggested that the alcohol use disorders comorbidity rate is higher for social anxiety disorder than for panic disorder (Chambless et al., 1987; Norton et al., 1996; Scheider et al., 2001). Although a couple of studies have found the opposite pattern of comorbidity with higher rates for panic disorder than for social anxiety disorder, these results may be confounded by the presence of individuals with specific phobias mixed into the social anxiety group. Specific phobias appear to have the lowest risk for alcohol use disorders among all the anxiety disorders (Himle and Hill, 1991), so combining social anxiety with specific phobias may result in lowered rates for the sample.

Furthermore, socially anxious individuals may use alcohol to self-medicate their anxiety in social situations, whereas individuals diagnosed with panic disorder often avoid substances such as alcohol that cause changes in their bodily sensations (Taylor, 1999). Whereas social anxiety disorder tends to develop before alcohol use disorders, panic disorder tends to develop after the alcohol use disorder (Öst, 1987). The symptoms of withdrawal from alcohol are similar to panic attack symptoms (George et al., 1988, 1990) and repeated alcoholic withdrawal may condition the occurrence of panic disorder in susceptible individuals (George et al., 1990). Thus, the progression of comorbidity of alcohol use disorders and these two anxiety disorders appears to be different for panic disorder than social anxiety disorder. Furthermore, an individual with comorbid alcohol use disorder and panic disorder as just described would more likely be seen in an alcohol treatment setting rather than an anxiety treatment setting. The need for treatment of the physiologic

symptoms of alcohol withdrawal and the severity of alcohol dependence that often accompanies physiologic dependence would far outweigh the need to pursue treatment for the anxiety disorder.

In summary, it seems that alcohol use and anxiety, particularly social anxiety disorder, are somehow related because the comorbidity rates of the two types of disorders are higher than the general population. Our previous research involving social anxiety disorder has not necessarily found higher rates of alcohol consumption than normal controls or dysthymics, contrary to assumptions derived from the association with alcohol use disorders (Ham et al., 2002). This surprising finding may be due to the measurement of drinking behavior in the previous study. The current study will use the SASSI-3, an instrument including subtle items, to examine individuals diagnosed with social anxiety disorder, panic disorder, and nondisordered individuals. A secondary purpose is to further examine the use of the SASSI-3 in clinical populations.

Hypotheses

It was hypothesized that individuals with social anxiety disorder would endorse more subtle aspects of substance abuse than those with panic disorder or nondisordered individuals, and those diagnosed with panic disorder would also endorse more of the subtle aspects of substance abuse than nondisordered individuals. However, no differences were expected among the three groups in self-reported drinking per month or in the face-valid measures of substance abuse, consistent with our previous study (Ham et al., 2002).

Furthermore, we hypothesized that greater endorsement of aspects of substance abuse would predict higher levels of fear of negative evaluation, a construct associated with social anxiety. This approach to examining social anxiety is dimensional rather than categorical to better examine the alcohol–social anxiety relation. This hypothesis is based on the premise that participants who endorse more subtle aspects of substance abuse, as well as defensiveness, on the SASSI-3 may tend to have lower self-reports of drinking based on responses during the structured diagnostic interview owing to social desirability. Because of research indicating that self-report combined with the SASSI may increase accuracy in identifying substance abusers (Horrigan and Piazza, 1999), we also hypothesized that a predictive model of self-reported drinking based on responses during a structured diagnostic interview and the SASSI-3 subscales would account for more variance in predicting fear of negative evaluation than a model including only the SASSI-3 subscales.

Methods

Participants

We recruited 39 individuals diagnosed with social anxiety disorder and 27 with panic disorder with ($N = 25$) and without ($N = 2$) agoraphobia seeking treatment at the University of Nebraska–Lincoln Anxiety Disorders Clinic for participation in the current study. In addition, 25 normal controls matched in age and gender were recruited through advertisements on the college campus as part of a larger study. Of these participants, 39 (42.9%) were men and 52 (57.1%) were women. Eighty-two (90.1%) participants identified themselves as having a White ethnic identity, 8 (8.9%) participants identified themselves as a

racial or ethnic minority, and 1 (1.1%) participant did not report ethnic identity. The mean age was 37.65 (*sd* = 13.95) years (range, 19–79) and the diagnostic groups did not differ by age, $F(2, 88) = 1.14$, not significant (NS).

Respondents who appeared to meet the inclusion/exclusion criteria (described below) during brief phone interviews were administered the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV; Brown et al., 1994). The ADIS-IV includes a Clinician's Severity Rating (CSR) on a 0–8 scale based on severity of anxiety and its degree of interference in functioning for each diagnosis. Those having a primary diagnosis of social anxiety disorder or panic disorder with or without agoraphobia according to the DSM-IV criteria (American Psychiatric Association, 1994) with a CSR ≥ 4 on a 0–8 scale were invited to participate in the study. Participants in the normal comparison group did not meet criteria for any Axis I diagnosis of clinical severity on the CSR (defined as ≥ 4). In addition, those in the normal control comparison group could not have received psychological treatment or taken psychotropic medications. The only exception was brief counseling for major life adjustments (e.g., divorce, grief) that occurred at least 2 years before the interview. Participants with comorbid diagnoses were invited to participate as long as the social anxiety disorder or panic disorder was determined to be the primary diagnosis (defined as the highest CSR). Five participants had comorbid panic disorder and social anxiety disorder diagnoses. All five had panic disorder as the primary diagnosis with a secondary diagnosis of social anxiety disorder that was of clinical severity. Participants were included if they met the above criteria and did not present with anything requiring immediate attention such as imminent suicidal intent or current psychotic symptoms.

Diagnostic interviewers in this study met rigorous standards for reliability with a trained ADIS-IV interviewer. Training included watching three interviews conducted by an experienced interviewer, then conducting at least five interviews under observation. The trainee was required to match an experienced interviewer on four of five observed interviews. Interviews were conducted by advanced doctoral students and a licensed psychologist. All cases were presented at staff meetings, and diagnoses were reviewed until a consensus was achieved.

Normal control participants received a payment of $35 in exchange for participation. Participants with social anxiety disorder and panic disorder received cognitive-behavioral treatment.

Materials

Symptom measures

To examine differences in symptom presentation, participants were administered measures to assess the core constructs of social anxiety, anxiety sensitivity, general anxiety, and depression. The Brief Fear of Negative Evaluation Scale (BFNE; Leary, 1983) is a 12-item self-report measure designed to measure social anxiety with a focus on concerns about social-evaluative threat. The BFNE has demonstrated very good internal consistency, test-retest reliability, and validity (Leary, 1983). The Anxiety Sensitivity Index (ASI; Peterson and Reiss, 1993) is a 16-item self-report measure designed to assess the extent to which a person finds anxiety-related sensations to be fearful or catastrophic in outcome (Peterson and

Plehn, 1999). The ASI is one of the most popular and well-researched measures for panic-related conditions (Antony, 2001) and has demonstrated excellent psychometric properties (Peterson and Reiss, 1993). The Beck Anxiety Inventory (BAI; Beck et al., 1988) is a 21-item self-report measure designed to measure symptoms of anxiety that are minimally shared with those of depression. The BAI has strong evidence of internal consistency, concurrent validity, and test-retest reliability (Beck et al., 1988) and has been found to discriminate between self-report and diary ratings of anxiety and depression better than the State-Trait Anxiety Inventory–Trait Version (Creamer et al., 1995). The Beck Depression Inventory–II (BDI-II; Beck et al., 1996) is a 21-item self-report measure that is commonly used to assess cognitive and somatic symptoms of depression. Dozois et al. (1998) reported that the BDI-II has acceptable reliability and validity.

In addition, the General Symptomatic Index (Derogatis et al., 1973) of the Symptom Checklist 90R (SCL-90-R; Derogatis, 1977) was used as a measure of general pathology. We used this index as a method of assessing the severity of both psychiatric groups to ensure that differences found between groups were not due to differences in the levels of general pathology.

Substance abuse

We examined substance abuse using SASSI-3 (Lazowski et al., 1998). The SASSI-3 has been found to have high 2-week test-retest reliability (0.92–1.00) and internal consistency (0.93). Validity analyses conducted on the development sample indicated a 95% correct classification with a sensitivity of 96% and specificity of 93%. Validity analyses conducted on a cross-validation sample indicated a 97% correct classification with a sensitivity of 97% and specificity of 95%. Compared with other screening measures such as the Michigan Alcohol Screening Test (Selzer, 1971), Addiction Potential Scale (Greene et al., 1992), Addiction Acknowledgment Scale (Weed et al., 1992), MacAndrew Alcoholism Scale–Revised (Butcher et al., 1989), and Millon Clinical Multiaxial Inventory–II Alcohol Dependence and Drug Dependence scales (Millon, 1987), those who were classified positive for substance abuse had higher mean scores on the other screening measures than those classified as negative for substance abuse.

To permit a more fine-grained analysis, the seven scales on the SASSI-3 were used to assess substance abuse/dependence. The Face Valid Alcohol (FVA) and Face Valid Other Drugs (FVOD) subscales assess whether the individual acknowledges substance usage (Lazowski et al., 1998; Miller et al., 1997) through direct questions about usage, motivations, and consequences of usage, tolerance, and physical dependence. The Symptoms of Substance Misuse (SYM) assesses the causes, consequences, and correlates of substance misuse. This includes excessive substance use (e.g., "I have sometimes drunk too much"), experiencing negative consequences from use (e.g., "When I drink or use drugs, I tend to get into trouble"), and being part of a family system that is affected by addictions (e.g., "My father was/is a heavy drinker or drug user"). The Obvious Attributes (OAT) subscale assesses the tendency to acknowledge characteristics often associated with substance misuse, such as impatience, low frustration tolerance, resentment, self-pity, and grandiosity. The Subtle Attributes (SAT) subscale assesses a basic personal style that is similar to substance-dependent people. The SAT was designed to assess characteristics that are less

apparent than those measured by OAT, including a tendency to detach from feelings and to have little insight into the basis and causes of problems. The Defensiveness (DEF) subscale is used to assess a tendency to deny signs of personal limitations and faults that may or may not be related to substance abuse in completing the SASSI-3. A high score on the DEF subscale may reflect an enduring character trait or a temporary reaction to a current situation. The Supplemental Addiction Measure (SAM) is not generally used for clinical interpretation but has been found to differentiate those who score high on the DEF subscale with substance dependence disorders from those with high DEF scores without such disorders. An elevated SAM scale suggests that the high DEF score may be related to alcohol or drugs. Additional information regarding similarity to family members of substance-dependent people in the Family vs. Controls scale (FAM) and similarity to individuals with extensive legal difficulties on the Correctional scale (COR) are not used in identifying individuals with substance abuse. Instead, they are more likely to be used in treatment planning. The FAM scale is an experimental scale that is intended to identify individuals who tend to focus on other people's needs instead of their own. The COR scale is intended to assess the individual's level of risk for legal problems, and higher scores on this scale may indicate the need for intense rehabilitative programming and supervision. The Random Answering Pattern (RAP) subscale is used to identify response patterns that are not meaningful. A score of Z1 on the RAP subscale indicates that the response pattern is not valid and therefore will not be included in the data analyses. No participants were excluded for invalid SASSI-3 scores.

Alcohol consumption

Alcohol consumption was measured by the amount of alcohol consumed per month as reported on the ADIS-IV (Brown et al., 1994). Previous research (Ham et al., 2002) found significant positive correlations (actual drinks, $r = .77$; estimated drinks, $r = .81$) with the Timeline Followback Daily Drinking Estimation Method (Sobell and Sobell, 1992).

Procedure

All participants signed an informed consent form after the nature of the procedures was explained. The questionnaires for this study were included as part of a larger packet to be completed at home after the ADIS-IV diagnostic interview. The packets were returned at a subsequent assessment session. Self-report measures were administered in a fixed order across samples.

Results

Table 1 presents summary demographic data for each of the diagnostic groups. There were no significant mean differences in age. Owing to small cell sizes, individuals with a high school diploma and/or some college were compared with those who had received a bachelor's degree (college graduate or at least some graduate school). Using these categories, the diagnostic groups did not differ on highest level of education attained. Normal controls and those diagnosed with panic disorder tended to be women, whereas participants with social anxiety disorder were more likely to be men. Owing to small cell sizes, single and

cohabitating individuals were compared with those who had ever been married. Individuals diagnosed with social anxiety disorder tended never to have been married (43.6% ever married), those diagnosed with panic disorder tended to have been married (74.1% ever married), whereas normal controls were equally likely to have been married or never been married (45.8% ever married).

Table 1. Demographics for individuals with social anxiety disorder, panic disorder, and normal controls

	Social anxiety disorder (*n* = 39)	Panic disorder (*n* = 27)	Normal control (*n* = 25)	Significance
Gender, M/F (%F)	23/16 (41%)	8/19 (70.4%)	8/17 (68%)	χ^2 = 7.27; *P* = .03
Age, mean (*sd*)	36.38 (11.61)	41.04 (15.56)	35.96 (15.34)	$F(2, 88)$ = 1.14; *P* = .32
Marital status				χ^2 = 6.86; *P* = .03[a]
Married	13 (33.3%)	17 (63.0%)	9 (36.0%)	
Single	21 (53.8%)	5 (18.5%)	11 (44.4%)	
Cohabitating	1 (2.6%)	2 (7.4%)	2 (8.0%)	
Divorced	4 (10.3%)	0 (0.0%)	2 (8.0%)	
Separated	0 (0.0%)	1 (3.7%)	0 (0.0%)	
Widowed	0 (0.0%)	2 (7.4%)	0 (0.0%)	
Education				χ^2 = .76; *P* = .15[b]
High school	6 (15.4%)	9 (34.6%)	3 (12.0%)	
Some college	14 (35.9%)	8 (30.8%)	7 (28.0%)	
College graduate	13 (33.3%)	3 (11.5%)	8 (32.0%)	
At least some graduate school	6 (15.4%)	6 (23.1%)	7 (28.0%)	

a. Owing to small cell sizes, single and cohabitating individuals were compared with those who had never been married.

b. Owing to small cell sizes, individuals with a high school diploma and/or some college were compared with those who had received a bachelor's degree (college graduate or at least some graduate school).

Overall, 8 participants (8.8%) were identified as having a high probability for having a substance dependence disorder according to the SASSI-3 screening decision rules. Of these participants, 6 were diagnosed with social anxiety disorder (16.2% of this diagnostic group), 2 were diagnosed with panic disorder (7.4% of this diagnostic group), and none were normal controls. The three groups did not significantly differ on this variable, $\chi^2(2)$ = 4.32, NS. Two of these 8 participants identified by the SASSI-3 (1 with social anxiety disorder and 1 with panic disorder) received an alcohol use disorder diagnosis on the ADIS-IV. The remaining 6 positive cases on the SASSI-3 had no ADIS-IV substance use diagnosis. Surprisingly, 1 individual who had an alcohol abuse diagnosis (primary diagnosis panic disorder) and 1 who had an alcohol dependence diagnosis (primary diagnosis social anxiety disorder) according to the ADIS-IV were not identified by the SASSI-3. Six individuals had at least one incomplete SASSI-3 subscale and could not be screened. Examination of their partial data indicated they would have been unlikely to receive a positive screening on the SASSI-3.

Preliminary Analyses

Table 2 presents means and standard deviations for analyses conducted in the preliminary analyses. Scores on the SCL-90R were entered into a one-way analysis of variance (ANOVA) with diagnostic group (social anxiety disorder vs. panic disorder vs. normal control) as the independent variable to ensure there were not differences between clinical groups in general pathology. We used least significant difference (LSD) tests to follow significant omnibus effects for all ANOVAs. As expected, socially anxious individuals and individuals with panic disorder reported higher SCL-90R scores than did normal controls but the social anxiety disorder and panic disorder groups did not differ from one another, $F(2, 83) = 29.25$, $P < .001$, $Mse = 2259.64$

Table 2. SCL-90R, BFNE, ASI, BAI, and BDI-II for individuals with social anxiety disorder, panic disorder, and normal controls

	Social anxiety disorder ($n = 39$)	Panic disorder ($n = 27$)	Normal control ($n = 25$)	Significance*
SCL-90R	110.89 (53.07)[a]	104.69 (53.70)[a]	19.32 (25.31)[b]	$F(2, 83) = 29.25$
BFNE	49.58 (7.47)[a]	39.50 (10.58)[b]	26.72 (7.74)[c]	$F(2, 82) = 32.94$
ASI	28.03 (11.87)[a]	30.26 (12.36)[a]	11.32 (8.44)[b]	$F(2, 88) = 22.76$
BAI	18.33 (9.60)[a]	23.06 (14.18)[a]	2.36 (4.35)[b]	$F(2, 88) = 29.55$
BDI-II	22.94 (12.42)[a]	17.67 (10.09)[b]	1.68 (2.30)[c]	$F(2, 88) = 35.95$

Values are expressed as mean (*sd*).

* $P < .001$ for all. Means with differing subscripts differ at $P < .05$.

SCL-90R = Symptom Checklist 90–Revised; BFNE = Brief Fear of Negative Evaluation Scale; ASI = Anxiety Sensitivity Index; BAI = Beck Anxiety Inventory; BDI-II = Beck Depression Inventory–II

Scores on the BFNE, ASI, BAI, and BDI-II were entered into separate one-way ANOVAs with diagnostic group (social anxiety disorder vs. panic disorder vs. normal control) as the independent variable. As expected, socially anxious individuals reported higher BFNE scores than participants with panic disorder who also differed from normal controls, $F(2, 82) = 32.94$, $P < .001$, $Mse = 70.75$. Socially anxious individuals and individuals with panic disorder reported higher ASI scores than did normal controls, $F(2, 88) = 22.76$, P < .001, $Mse = 125.41$. However, the social anxiety disorder and panic disorder groups did not differ. As expected, socially anxious individuals and individuals with panic disorder reported higher BAI scores than did normal controls, $F(2, 88) = 29.55$, $P < .001$, $Mse = 104.38$. The social anxiety disorder and panic disorder groups did not differ. Socially anxious individuals achieved higher BDI-II scores than either individuals with panic disorder or normal controls, $F(2, 88) = 35.95$, $P < .001$, $Mse = 98.18$. Participants with panic disorder also had higher BDI-II scores than the normal controls. Because depression differs among the three diagnostic groups, all further analyses were controlled for depression to ensure that effects could not be attributed to depression.

Face Valid and Subtle Aspects of Substance Abuse[1]

We hypothesized that individuals with social anxiety disorder would endorse more subtle aspects of substance abuse than those with panic disorder who would endorse more subtle aspects than nondisordered individuals. Furthermore, no differences were expected among the three groups in self-reported drinking per month or in the face-valid measures of substance abuse. We conducted a multivariate analysis of variance with diagnostic group (social anxiety disorder vs. panic disorder vs. normal control) as the independent variable, the FVA, FVOD, SYM, OAT, SAT, DEF, and SAM SASSI-3 subscales and the ADIS-IV alcohol item as the dependent variables, and the BDI-II score as the covariate. Table 3 lists adjusted means for these dependent variables. Consistent with the hypotheses, there was a significant multivariate effect of these dependent variables among the three diagnostic groups, Wilks's λ = .59; $F(16, 138)$ = 2.63; P = .001. Follow-up univariate ANOVAs revealed significant diagnostic group differences for the FVA subscale, $F(2, 76)$ = 3.35, P = .04; the OAT subscale, $F(2, 76)$ = 3.28, P = .04; and the SAM subscale, $F(2, 76)$ = 4.49, P = .01. However, no significant univariate effects were found for the SYM subscale, $F(2, 76)$ = .18, *ns*, SAT subscale, $F(2, 76)$ = .48, *ns*, or DEF subscale, $F(2, 76)$ = 1.25, *ns*. As expected, no differences were found on the ADIS-IV item, $F(2, 76)$ = .72, *ns*, and the FVOD subscale, $F(2, 76)$ = .60, *ns*, across diagnostic group. Follow-ups using the LSD procedure indicated partial support for the hypotheses regarding both the face-valid and subtle items. As hypothesized, socially anxious individuals had higher scores on the OAT subscale than both the individuals with panic disorder and normal controls. The latter two groups did not differ. Consistent with hypotheses, both individuals with social anxiety disorder and panic disorder had higher scores on the SAM subscale than normal controls. However, the social anxiety disorder and panic disorder groups did not differ on the SAM subscale score. Contrary to the hypotheses, normal controls had higher scores on the FVA subscale than both individuals with social anxiety disorder and panic disorder. However, as hypothesized, the latter two groups did not differ.

Table 3. Adjusted means when controlling for BDI-II scores for ADIS-IV drinks per month and the SASSI-3 subscales for individuals with social anxiety disorder, individuals with panic disorder, and normal controls

	Social anxiety disorder (*n* = 33)	Panic disorder (*n* = 25)	Normal controls (*n* = 22)
ADIS-IV drinks per month	4.85	7.81	11.48
Face valid alcohol	1.27[a]	1.62[a]	3.96[b]
Face valid other rugs	1.82	0.85	0.57
Symptoms of misuse	2.32	2.64	2.57
Obvious attributes	4.86[a]	3.61[b]	3.65[b]
Subtle attributes	1.92	2.01	2.34
Defensiveness	4.47	5.21	4.55
Supplemental addiction measure	5.49[a]	5.64[a]	3.95[b]
Family vs. controls	9.49	9.27	8.68
Correctional	4.57	4.10	3.76

Means with differing superscripts differ at P < .05.

ADIS-IV = Anxiety Disorder Interview Schedule for DSM-IV.

Predictive Models of Fear of Negative Evaluation[2]

We hypothesized that higher endorsement of aspects of substance abuse would predict fear of negative evaluation regardless of diagnosis. Furthermore, we hypothesized that a predictive model including the SASSI-3 subscales and the ADIS-IV alcohol item would account for more variance in predicting fear of negative evaluation than the model including only the SASSI-3 subscales. To test these hypotheses, we performed a hierarchical regression with the BFNE as the criterion. Table 4 shows correlations among variables controlling for the BDI-II. The first regression block included the BDI-II as the predictor to control for this variable in the regression. Next, the SASSI-3 subscales were entered as predictors in a stepwise multiple regression. Finally, the ADIS-IV alcohol item was entered to examine whether this item added significant variance to the model including only the SASSI-3 subscales. The first model, with the BFNE as a criterion and the BDI-II as a predictor, accounted for significant variance, $R^2 = 0.42$, $F(1, 68) = 48.68$, $P < .001$. In the next block, the FVA, FVOD, SYM, OAT, SAT, DEF, and SAM SASSI-3 subscales were entered as predictors into a stepwise multiple regression. As shown in Table 5, only the SAM subscale entered into the regression, $R^2 = 0.46$, $F(2, 67) = 28.39$, $P < .001$, and added significant variance to the model, R^2-change = 0.04, = .03. Contrary to the hypotheses, no other SASSI-3 subscales made significant independent contributions to the model. An examination of the beta weights in Table 5 indicates that, when controlling for the BDI-II score, the higher the SAM scores were, the greater was the BFNE score. The ADIS-IV alcohol item was then added as another predictor for the third block. As shown in Table 5, this did not add significant variance to the model, $R^2 = 0.46$, $F(3, 66) = 18.94$, $P < .001$, R^2-change = 0.004, $P = .49$. Contrary to the hypothesis, the ADIS-IV alcohol item did not significantly contribute to the model.

Table 4. Partial correlations among scales of SASSI-3, ADIS-IV drinks per month, ASI, BFNE, and BAI when controlling for BDI-II score

	FVA	FVOD	SYM	OAT	SAT	DEF	SAM	ADIS-IV
ASI	−.15	−.22	−.04	< −.01	−.31[b]	.08	.01	−.09
BFNE	−.03	.08	.16	.23	−.14	−.09	.27[a]	−.03
BAI	−.19	−.19	−.11	−.16	−.07	.06	.11	−.07

N ranges from 89 to 91 owing to missing data.

a. *P* < .05, b. *P* < .01

BFNE = Brief Fear of Negative Evaluation scale; ASI = Anxiety Sensitivity Index; BAI = Beck Anxiety Inventory; FVA = face valid alcohol; FVOD = face valid other drugs; SYM = symptoms of substance misuse; OAT = obvious attributes; SAT = subtle attributes; DEF = defensiveness; SAM = supplemental addiction measure; ADIS-IV = Anxiety Disorder Interview Schedule for DSM-IV

Table 5. Predictive models of fear of negative evaluation when controlling for depression

	Beta weight	Significance
First model: R^2 = .46		
BDI-II	0.52	< .001
SAM	0.66	.03
Second model: R^2 = .46, R-change = .004		
BDI-II	0.51	< .001
SAM	0.25	.02
ADIS-IV	−0.06	.49

BDI-II = Beck Depression Inventory–II; SAM = supplemental addiction measure; ADIS-IV = Anxiety Disorder Interview Schedule for DSM-IV. N = 69.

Discussion

This study examined aspects of substance abuse in individuals diagnosed with social anxiety disorder or panic disorder, and nondisordered individuals using the SASSI-3 as it includes subtle items to control for social desirability. Previous research has shown that there is an association between alcohol and anxiety, particularly social anxiety (e.g., Schneider et al., 2001). However, recent work finding no differences in self-reported drinking rates in socially anxious individuals, dysthymic individuals, and normal controls (Ham et al., 2002) prompted the current research endeavor using a more sophisticated measure of substance abuse.

We hypothesized that individuals with social anxiety disorder would endorse more subtle aspects of substance abuse than those with panic disorder or nondisordered individuals, and those diagnosed with panic disorder would also endorse more of the subtle aspects of substance abuse than nondisordered individuals. There was partial support for these hypotheses because socially anxious individuals had higher scores than normal controls on both the SAM subscale that differentiates those who are highly defensive with substance dependence disorders from those that are highly defensive without such disorders and the OAT subscale that assesses characteristics often associated with substance misuse, such as such as impulsiveness, low frustration tolerance, impatience, resentment, self-pity, and grandiosity. However, individuals with panic disorder did not differ from normal controls on the OAT subscale and did not differ from individuals with social anxiety disorder on the SAM subscale. There were no other significant differences among the three groups on other SASSI-3 subtle subscales. These findings indicate that anxious individuals may be more likely to be identified as defensive and substance dependent than nondisordered individuals. In addition, individuals with social anxiety disorder seem to have higher levels of the characteristics associated with misuse, which seems to be a relation unique to social anxiety in this study. Although this may indicate a stronger relation between social anxiety and substance abuse, it seems more likely that this finding simply indicates that socially anxious individuals have many negative characteristics that have also been associated with substance abuse.

No differences were expected among the three groups in self-reported drinking per month or in the face valid measures of substance abuse, consistent with our previous research. This hypothesis was partially supported in that there were no differences among the three groups in self-reported drinking per month and in acknowledging substance usage other than alcohol. However, nondisordered individuals actually were found to have higher scores on the subscale dealing with acknowledging alcohol use than the other two diagnostic groups. This seems consistent with prior hypotheses pertaining to the social desirability of alcohol consumption in individuals seeking treatment for anxiety disorders. Alternatively, this result seems to support the suppressor effect of alcohol, proposing that socially anxious individuals actually consume less alcohol owing to fears of its disinhibiting effects than individuals without social anxiety disorder (Bruch et al., 1992). There have also been findings supporting a similar effect in individuals with panic disorder, with a fear of anticipated bodily sensations (e.g., dizziness) leading to less alcohol consumption (Taylor, 1999).

We hypothesized that endorsing more aspects of substance abuse would predict fear of negative evaluation. We also hypothesized that a predictive model of self-reported drinking per month and the SASSI-3 subscales would account for more variance in predicting fear of negative evaluation than the model including only the SASSI-3 subscales. Contrary to the hypotheses, depression was a better predictor of fear of negative evaluation than the SASSI-3 variables or self-reported level of alcohol consumption. In addition, self-reported level of alcohol consumption did not add significant variance to the predictive model. In the stepwise regression model, the SAM subscale (i.e., differentiates those who are highly defensive with substance dependence disorders from those who are highly defensive without such disorders) was the only significant hypothesized predictor of fear of negative evaluation. However, this subscale accounted for only a small percentage of the variance when controlling for depression. This result indicates that those who are highly fearful of negative evaluation may tend to be identified as defensive with substance dependence. According to Miller et al. (1997), an individual with a high Defensiveness score may be hypersensitive to criticism, a key characteristic of individuals diagnosed with social anxiety disorder. Therefore, it seems that caution is warranted in using the SASSI-3 with socially anxious populations.

There may also be a subgroup of socially anxious individuals who abstain from alcohol because they fear its disinhibiting effects, as Bruch et al. (1992) proposed. This concept is supported by recent research finding a U-shaped or J-shaped relation between anxiety and alcohol use, where there are a greater proportion of individuals with high levels of anxiety who either abstain or have alcohol use diagnoses, with few who are moderate alcohol users (Degenhardt et al., 2001; Rodgers et al., 2000). Because this was an outpatient sample, it may not have consisted of individuals with the highest levels of anxiety severity.

Limitations to this study must be mentioned. First, although the clinical sample did not include substance-related disorders as exclusionary criteria, this was not a high substance-using population. As previously mentioned, only 8.8% of participants were identified as having a high probability of a substance dependence disorder according to the SASSI-3. Previous research with the SASSI-3 has provided evidence for using the measure as a

screening tool for substance dependence but has not provided substantial evidence supporting the use of the measure for screening substance abuse. This is because there were a limited number of individuals with substance abuse included in the normative samples for the SASSI-3 (Miller and Lazowski, 1999). The current study used the SASSI-3 subscales rather than the screening algorithm to examine abuse as well as dependence. This was not the original intent of the scale developers.

Another explanation for the lack of many significant effects specific to social anxiety disorder may be that it is more useful to emphasize the commonalities among anxiety disorders rather than the distinctions. Brown et al. (1998) found that social anxiety and panic disorder and other anxiety disorders have significant positive correlations with negative affect. According to Brown and Barlow (2002), these findings could be interpreted as the result of a shared negative affect vulnerability dimension. Because few measures were able to distinguish social anxiety disorder from panic disorder, and depression was the greatest predictor of fear of negative evaluation, negative affect may be the common construct shared between the diagnostic groups and assessed by the BDI-II.

These results also raise questions about the nature of the construct assessed by the SASSI-3 subtle scales. The zero-order correlations indicate positive associations between depression and the SASSI-3 SYM, OAT, and SAM subscales and a negative association between depression and the Defensiveness subscale (all $Ps < .001$). Many of the correlations between social anxiety and the SASSI-III subscales were no longer significant after controlling for depression. Perhaps the SASSI-3 subtle subscales are actually a measure of general psychopathology rather than of depression or characteristics specific to substance abusers. General psychopathology as assessed by the SCL-90-R was strongly related to the SASSI-3 SYM ($r = .44$, $P < .001$), OAT ($r = .62$, $P < .001$), and SAM ($r = .55$, $P < .001$) subscales. The SASSI-3 subscales may be assessing one's level of psychopathology, a construct that is much more general than substance abuse. Thus, it may be possible that the SASSI-3 may overidentify socially anxious individuals as substance dependent. This may explain the higher level of socially anxious individuals (16.2%) identified as substance dependent by the SASSI-3 than individuals with panic disorder (7.4%, as well as the higher level of individuals identified as substance dependent by the SASSI-3 than by the ADIS-IV interview). This has important implications in using the SASSI-3 as a screening measure in clinical practice.

Correlational analyses controlling for depression reveal that there seemed to be some unique relations between fear of negative evaluation that were not present for general anxiety and anxiety sensitivity. Individuals highly fearful of negative evaluation also tended to be identified as highly defensive with substance dependence disorders and had a trend for having characteristics (i.e., impulsiveness, low frustration tolerance, impatience, resentment, self-pity, grandiosity) associated with substance misuse ($P = .058$). However, there were no significant relations with general anxiety and only one negative relation among anxiety sensitivity and a basic personal style that is similar to substance-dependent people. Thus, there is some evidence that the fear of negative evaluation construct has a different relation to substance abuse than does general anxiety or anxiety sensitivity.

In conclusion, few aspects of substance abuse were significantly greater for individuals with social anxiety disorder than those with panic disorder or normal controls. Further

research is needed to explore whether these differences are unique to social anxiety or simply an underlying negative affect construct. Another important direction of future research involves examining the SASSI-3 to determine whether social anxiety may contribute to false positives for substance abuse. It is recommended that the SASSI-3 be interpreted with caution in socially anxious populations. Further research is needed to determine whether the SASSI-3 subscales are examining subtle aspects of substance abuse or general psychopathology. Because social anxiety disorder and alcohol use disorders have high comorbidity rates, it is essential that we have an understanding of this relation and develop valid measures to identify substance abusers in socially anxious populations, and vice versa. In addition, identifying the propensity for socially anxious individuals to misuse alcohol and other substances would be helpful in the prevention of such comorbid conditions.

Notes

1. Analyses were also conducted without controlling for depression. These MANOVAs and ANOVAs yielded somewhat different results. The MANOVAs revealed a similar effect for diagnostic group for the SYM, OAT, DEF, and SAM subscales. According to follow-up ANOVAs, the pattern was similar on the SAM scale but the OAT scale scores differed among the three diagnostic groups, with socially anxious individuals having the highest scores and normal controls having the lowest scores. In addition, individuals with social anxiety disorder and panic disorder had higher scores on the SYM scale than normal controls, with no differences between the latter two groups. The three diagnostic groups differed on the DEF subscale. Contrary to hypotheses, normal controls had the highest scores on the DEF scale and socially anxious individuals had the lowest scores.

2. Stepwise regressional analyses conducted without controlling for depression revealed that the OAT, SAT, and SAM subscales provided significant contributions to the model (R^2 = .41, F(3, 66) = 15.16, P < .001). The OAT and SAM subscales had positive beta weights, whereas the SAT subscale had a negative beta weight.

References

Antony MM. 2001. Measures for panic disorder and agoraphobia. In: Antony MM, Orsillo SM, Roemer L, editors. Practitioner's guide to empirically based measures of anxiety. AABT clinical assessment series. New York: Kluwer Academic/Plenum. p 95–125.

American Psychiatric Association. 1994. Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: APA.

Beck AT, Epstein N, Brown G, Steer RA. 1988. An inventory for measuring clinical anxiety: Psychometric properties. J Consult Clin Psychol 56:893–897.

Beck AT, Steer RA, Ball R, Ranieri WF. 1996. Comparison of Beck Depression Inventories–1A and –II in psychiatric outpatients. J Pers Assess 67:588–597.

Brown TA, Barlow DH. 2002. Classification of anxiety and mood disorders. In: Barlow DH, editor. Anxiety and its disorders: The nature and treatment of anxiety and panic. New York: Guilford Press. p 292–327.

Brown TA, Chorpita BF, Barlow DH. 1998. Structural relationships among dimensions of the DSM-IV anxiety and mood disorders and dimensions of negative affect, positive affect, and autonomic arousal. J Abnorm Psychol 107:179–192.

Brown TA, DiNardo PA, Barlow DH. 1994. Anxiety Disorders Interview Schedule—4th Edition (ADIS-IV). Albany, NY: Center for Stress and Anxiety Disorders, University at Albany, State University of New York.

Bruch MA, Heimberg RG, Harvey CH, McCann M, Mahon M, Slavkin S. 1992. Shyness, alcohol expectancies, and alcohol use: Discovery of a suppressor effect. J Res Person 23: 137–149.

Butcher JN, Dahlstrom WG, Graham JR, Tellegen A, Kaemmer B. 1989. Minnesota Multiphasic Personality Inventory–2: Manual for administration and scoring. Minneapolis, MN: University of Minnesota Press.

Chambless DL, Cherney J, Caputo GC, Rheinstein BJG. 1987. Anxiety disorders and alcoholism: A study with inpatient alcoholics. J Anxiety Disord 1:29–40.

Cox BJ, Swinson RP, Direnfeld DM, Bourdeau D. (1993). Social desirability and self-reports of alcohol abuse in anxiety disorder patients. Behav Res Ther 32:175–178.

Creamer M, Foran J, Bell, R. 1995. The Beck Anxiety Inventory in a non-clinical sample. Behav Res Ther 33:477–485.

Davidson JRT, Hughes DL, George LK, Blazer DG. 1993. The epidemiology of social phobia: Findings from the Duke Epidemiological Catchment Area Study. Psychol Med 23: 709–718.

Degenhardt L, Hall W, Lynskey M. 2001. Alcohol, cannabis, and tobacco use among Australians: A comparison of their associations with other drug use and use disorders, affective and anxiety disorders, and psychosis. Addiction 96:1603–1614.

Derogatis L. 1977. The SCL-90 manual I: Scoring, administration, and procedures for the SCL-90. John Hopkins University School of Medicine, Clinical Psychometrics Unit.

Derogatis LR, Lipman RS, Covi L. 1973. SCL-90: An outpatient psychiatric rating scale—preliminary report. Psychopharmacol Bull 9:13–28.

Dozois DJA, Dobson KS, Ahnberg JL. 1998. A psychometric evaluation of the Beck Depression Inventory–II. Psychol Asses 10:83–89.

George DT, Nutt DJ, Dwyer BA, Linnoila M. 1990. Alcoholism and panic disorder: Is the comorbidity more than coincidence? Acta Psychiatr Scand 81:97–107.

George DT, Zerby A, Noble S, Nutt DJ. 1988. Panic attacks and alcohol withdrawal: Can subjects differentiate the symptoms? Biol Psychiatry 24:240–243.

Greene RL, Weed NC, Butcher JN, Arredondo R, Davis HG. 1992. A cross-validation of MMPI-2 substance abuse scales. J Pers Assess 58:405–410.

Ham LH, Hope DA, White CS, Rivers PC. 2002. Alcohol expectancies and drinking behavior in adults with social anxiety disorder and dysthymia. Cog Ther Res 26:275–288.

Hasin D, Carpenter KM. 1998. Difficulties with questions on usual drinking and the measurement of alcohol consumption. Alcohol Clin Exp Res 22:580–584.

Himle JA, Hill EM. 1991. Alcohol abuse and the anxiety disorders: Evidence from the Epidemiologic Catchment Area Survey. J Anxiety Disord 5:237–245.

Holle C, Heimberg RG, Sweet RA, Holt CS. 1995. Alcohol and caffeine use by social phobics: An initial inquiry into drinking patterns and behavior. Behav Res Ther 33:561–566.

Horrigan TJ, Piazza N. 1999. The Substance Abuse Subtle Screening Inventory minimized the need for toxicology screening of prenatal patients. J Subst Abuse Treat 17:243–247.

Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, Wittchen HV, Kendler KS. 1994. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Arch Gen Psychiatry 51:8–19.

Kushner MG, Abrams K, Borchardt C. 2000. The relationship between anxiety disorders and alcohol use disorders: A review of major perspectives and findings. Clin Psychol Rev 20:149–171.

Kushner MG, Sher KJ, Beitman BD. 1990. The relation between alcohol problems and the anxiety disorders. Am J Psychiatry 147:685–695.

Lazowski LE, Miller FG, Boye MW, Miller GA. 1998. Efficacy of the Substance Abuse Subtle Screening Inventory–3 (SASSI-3) in identifying substance abuse dependence disorders in clinical settings. J Pers Assess 71:114–128.

Leary MR. 1983. A brief version of the Fear of Negative Evaluation scale. Pers Soc Psychol Bull 9:371–375.

Miller FG, Lazowski LE. 1999. The Substance Abuse Subtle Screening Inventory–3 manual. Springville, IN: SASSI Institute.

Miller FG, Roberts J, Brooks MK, Lazowski LE. 1997. SASSI-3 user's guide: A quick reference for administration and scoring. Bloomington, IN: Baugh Enterprises.

Millon T. 1987. On the nature of taxonomy in psychopathology. In: Last CG, Hersen M, editors. Issues in diagnostic research. New York: Plenum Press. p 3–85.

Mullaney JA, Trippett CJ. 1979. Alcohol dependence and phobias: Clinical description and relevance. Br J Psychiatry 135:563–573.

Norton GR, McLeod L, Guertin J, Hewitt PL, Walker JR, Stein MB. 1996. Panic disorder or social phobia: Which is worse? Behav Res Ther 34:273–276.

Öst LG. 1987. Age of onset in different phobias. J Abnorm Psychol 96:223–229.

Otto RK, Lang AR, Megargee EI, Rosenblatt AI. 1988. Ability of alcoholics to escape detection by the MMPI. J Consult Clin Psychol 46:452–457.

Peterson RA, Plehn K. 1999. Measuring anxiety sensitivity. In: Taylor S, editor. Anxiety sensitivity: Theory, research, and treatment of the fear of anxiety. Mahwah, NJ: Erlbaum. p 61–81.

Peterson RA, Reiss S. 1992. Anxiety Sensitivity Index Manual (2nd ed.). Worthington, OH: International Diagnostic Systems. Piazza NJ, Martin N, Dildine RJ. 2000. Screening instruments for alcohol and other drug problems. J Ment Health Couns 22: 218–227.

Quitkin FM, Riftin A, Kaplan J, Klein DF. 1972. Phobic anxiety syndrome complicated by drug dependence and addiction. Arch Gen Psychiatry 27:159–162.

Regier DA, Farmer ME, Rae DS, Locke BZ, Keith SJ, Judd LL, Goodwin FK. 1990. Comorbidity of mental disorders with alcohol and other drug abuse: Results from the Epidemiologic Catchment Area (ECA) Study. JAMA 264:2511–2518.

Rodgers B, Korten A, Jorm A, Christensen H, Henderson S, Jacomb P. 2000. Risk factors for depression and anxiety in abstainers, moderate drinkers, and heavy drinkers. Addiction 95:1833–1845.

Sanderson WC, DiNardo PA, Rapee RM, Barlow DH. 1990. Syndrome comorbidity in patients with a DSM-III-R anxiety disorder. J Abnorm Psychol 99:308–312.

Schneider U, Altmann A, Baumann M, Bernzen J, Bertz B, Bimber U, Broese T, Broocks A, Burtcheidt W, Cimander KF, et al. 2001. Comorbid anxiety and affective disorders in alcohol-dependent patients seeking treatment: The first multicentre study in Germany. Alcohol Alcohol 36:219–223.

Selzer ML, Vinokur A, Van Rooljen L. 1975. A self-administered Short Michigan Alcoholism Screening Test (SMAST). J Stud Alcohol 36:117–126.

Sobell L, Sobell M. 1990. Self-report issues in alcohol abuse: State of the art and future directions. Behav Assess 12:77–90.

Sobell L, Sobell M. 1992. Timeline follow-back: A technique for assessing self-reported alcohol consumption. In: Litten R, Allen J, editors. Measuring alcohol consumption. Totowa, NJ: Humana Press. p 41–72.

Taylor S, editor. 1999. Anxiety sensitivity: Theory, research, and treatment of the fear of anxiety. Mahwah, NJ: Erlbaum.

Van Ameringen M, Mancini C, Styan G, Donison D. 1991. Relationship of social phobia with other psychiatric illness. J Affect Disord 21:93–99.

Weed NC, Butcher JN, McKenna T, Ben-Porath YS. 1992. New measures for assessing alcohol and drug abuse with the MMPI-2: The APS and AAS. J Pers Assess 58:389–404.