Expectations and Motives for Substance Use in Schizophrenia

by Kim T. Mueser, Pallavi Nishith, Joseph I. Tracy, Joanne DeGirolamo, and Max Molinaro

Abstract

This study examined the internal reliability of standardized measures of substance use expectancies and motives in a schizophrenia population (n = 70) and the relationship of these expectancies and motives to alcohol and drug use disorders. Internal reliabilities were uniformly high for the subscales of the expectancy and motive measures. Analyses of the relationship between substance use disorders and expectancies revealed strong substance-specific expectations. Alcohol expectancies were related to alcohol disorders but not to drug disorders; cocaine expectancies were related to drug but not to alcohol disorders; and marijuana expectancies were more strongly related to drug than to alcohol use disorders. In contrast, motives were related to substance use disorders, and self-reported substance use problems were related to expectancies and motives in a non-specific manner. These results suggest that expectancy and motive questionnaires developed for the primary substance abuse population may be valid for psychiatric populations. Research on motives and expectancies may help to clarify the functions of substance abuse in persons with schizophrenia.


Over the past decade, there has been a growing awareness of the problem of comorbid substance use disorders in schizophrenia. Estimates of the prevalence of comorbidity among persons with schizophrenia are high, usually ranging between 20 and 60 percent (Mueser et al. 1990; Regier et al. 1990). This is of particular concern considering the negative impact of substance use disorders on the course of the illness (Drake et al. 1989), as well as the increased service utilization and costs associated with comorbidity (Bartels et al. 1993). Yet, very little is known about why schizophrenia patients use substances, what they expect from that use, and how either of these factors relates to the etiology or maintenance of the substance abuse.

With increased research being directed toward the development of more effective interventions for schizophrenia patients with substance use disorders, some investigators have been exploring the reasons patients give for their substance use and the perceived effects of such use. Current treatment modalities for patients with schizophrenia who abuse substances often assume that these individuals have the same expectancies and reasons for use as primary substance abusers; however, such an assumption has yet to be tested. The ability to obtain valid assessments of motives or perceived effects from patients with schizophrenia who abuse substances often assume that these individuals have the same expectancies and reasons for use as primary substance abusers; however, such an assumption has yet to be tested. The ability to obtain valid assessments of motives or perceived effects from patients with schizophrenia might facilitate the tailoring of interventions for substance use disorders to address the specific needs of individual patients.

Surveys of schizophrenia patients with a substance use disorder conducted by Test et al. (1989), Dixon et al. (1991), and Noordsy et al. (1991) have reported a range of...
different motives for patients' substance use, the most common among them being to reduce anxiety or depression, improve sleep, facilitate socialization, and enhance pleasure (or reduce anhedonia). These studies suggest that patients with schizophrenia are capable of articulating their reasons for using substances. However, the validity of these reports is unknown. Moreover, the conclusions that can be drawn from these studies are limited. First, standardized instruments were not used to assess motives for substance use or its perceived effects. Second, self-reports were obtained from patients with a history of substance use disorder but not from patients with no such history; therefore, it is unclear whether there was a relationship between the reasons given for substance use and the presence of a substance use disorder.

The present study was conducted to examine the relationship between expectancies and motives for substance use, and a history of substance abuse in schizophrenia. It goes beyond previous research on reasons for substance abuse in schizophrenia by using instruments that have been standardized in the general population and by assessing patients both with and without a substance abuse history. We elected to examine substance use expectancies in addition to motives because prior studies have shown that expectancies for the effects of substances are related to a history of substance abuse in the general and alcoholic population (Brown et al. 1987; Schafer and Brown 1991; Goldman 1994). Expectancies and motives for substance use theoretically are distinct, with the latter thought to be more proximate to actual substance abuse behavior (Cooper 1994). Although both have been posited as etiological factors in the development of alcohol and drug use disorders (e.g., Cox and Klinger 1988; Cooper et al. 1992a), research has not examined these constructs together in the population of patients with schizophrenia.

Thus, one goal of this study was to examine whether a similar pattern of associations was found in substance use disorders and in expectancies or motives.

We examined two general hypotheses: (1) that patients with a history of alcohol or drug use disorder would endorse stronger expectancies and motives for substance use than patients with no substance use disorder; and (2) that the associations between substance use disorder and the motives for and expectancies of use would be stronger within a given substance than across different substances. In other words, we expected that patients with a history of alcohol use disorder would endorse stronger expectancies and motives for alcohol use than for drug use and, conversely, that patients with a history of drug use disorder would endorse stronger expectancies and motives for drug use than for alcohol use.

Method

Subjects. The subjects were 70 patients with diagnoses of either schizophrenia (n = 51, 73%) or schizoaffective disorder (n = 19, 27%). Patients were selected if they had a chart diagnosis of schizophrenia or schizoaffective disorder based on DSM-III-R (American Psychiatric Association 1987) criteria or were diagnosed based on the Structured Clinical

Interview for DSM-III-R (SCID; Spitzer et al. 1990). SCID interviews for a primary diagnosis of schizophrenia or schizoaffective disorder were available for 37 subjects (53%). Patients with neurologic conditions having a clear central nervous system impact, based on chart review, were excluded. Subjects were assessed in three different psychiatric settings: an acute inpatient setting (Medical College of Pennsylvania at Eastern Pennsylvania Psychiatric Institute [MCP/EPPI]), where patients were admitted for brief (2-4 week) treatment of a symptom exacerbation (n = 22, 31%); an outpatient clinic at MCP/EPPI (n = 29, 41%), where the average patient had been treated for 4 years; and a chronic inpatient setting (Norristown State Hospital; n = 19, 27%).

A total of 45 patients (64%) were male, and 22 (29%) were African-American. The mean age was 36.7 years (standard deviation [SD] = 8.68; range: 21-59), with a mean of 7.1 prior hospitalizations.

1To determine whether a history of substance use disorder was related to how a diagnosis of schizophrenia or schizoaffective disorder was made, two chi-square analyses were performed, one for alcohol use disorder (never, past, recent) and diagnostic method (SCID, chart) and one for drug use disorder and diagnostic method. The chi-square for alcohol use disorder was significant (χ² = 9.01, df = 2, p = 0.01), but that for drug use disorder was not (χ² = 4.66, df = 2, not significant). Patients with a current or past history of alcohol use disorder were more likely to have been diagnosed with schizophrenia or schizoaffective disorder by chart (70% and 56%, respectively) than were patients with no history of alcohol abuse (29%).
obtain a measure of drug use motives, we adapted the DMM by substituting the words "drug use" for "drinking"—hence, the Drug Use Motives Measure (DUMM).

Measures. Measures were used to assess two broad areas: (1) motives for and expectancies from substance use; and (2) substance use disorders and problems.

Motives and expectancies. Motives for alcohol use were assessed with the Drinking Motives Measure (DMM; Cooper et al. 1992b). This instrument measures three different motives for drinking: social motives, coping motives, and enhancement of positive affect. It includes 15 items, each rated on a 4-point Likert scale (1 = almost never/never, 4 = almost always). Following the procedure of Cooper et al. (1992b), the scale was administered orally to patients who drank at least once during their lifetime. The DMM was developed and validated in the general population, and it has good internal reliability and predictive validity (e.g., it discriminates people with a history of alcohol abuse from alcohol use).

To our knowledge, there is no available scale comparable to the DMM for assessing motives for using drugs. However, schizophrenia patients frequently cite similar motives for using drugs as for using alcohol, such as socialization, pleasure enhancement, and coping with symptoms (Test et al. 1989; Dixon et al. 1991). Therefore, to obtain a measure of drug use motives, we adapted the DMM by substituting the words "drug use" for "drinking"—hence, the Drug Use Motives Measure (DUMM).

The DUMM was administered in the same fashion as the DMM to those patients who used an illicit drug (e.g., cannabis, cocaine) at least once in their lifetime.

Surveys of substance use disorders and patterns of abuse in psychiatric patients have found that alcohol is the most frequently abused substance, followed by marijuana and cocaine (Mueser et al. 1990, 1992; Regier et al. 1990; Cuffel et al. 1993). Therefore, substance use expectancies were assessed for the effects of these three classes of substances using three scales: the Alcohol Effect Expectancy Questionnaire (AEEQ; Brown et al. 1987), the Marijuana Effect Expectancy Questionnaire (MEEQ; Schafer and Brown 1991), and the Cocaine Effect Expectancy Questionnaire (CEEQ; Schafer and Brown 1991). These scales contain items describing the common effects of each substance (e.g., "When I smoke marijuana it helps me escape reality"). Subjects are asked to agree or disagree with each item according to their own current thoughts, feelings, and beliefs about the effects of the substance. The AEEQ and MEEQ each contain six subscales whereas the CEEQ contains five. The expectancy scales have high test-retest reliabilities and have been found to distinguish between patterns of nonuse and varying degrees of use in the general population. Patients with adequate reading skills completed the expectancy questionnaires themselves; others had the questions read to them. In contrast to the DMM and the DUMM, the expectancy measures were administered to all patients, regardless of whether they had ever tried the substance, in line with procedures recommended by the developers of these scales.

Substance use disorders and problems. Alcohol use disorders (using DSM-III-R criteria) were assessed with the Case Manager Rating Scale (CMRS—Alcohol; Drake et al. 1990), which was based on both a semistructured interview and a chart review. A parallel form of this instrument was used to assess drug use disorders (CMRS—Drug; Drake et al. 1990). These scales were used to assess both lifetime and recent (past year) alcohol and drug use disorders separately. Previous research on the CMRS indicates that it has good reliability and validity in patients with schizophrenia when compared with structured clinical interviews for substance use disorders, such as the SCID (Drake et al. 1990). Ratings are made on 5-point, behaviorally anchored rating scales. The low end of the scales corresponds to either no alcohol/drug use (1) or alcohol/drug use without any problems (2), whereas higher scores (3–5) indicate increasing degrees of problem severity, corresponding to the symptoms required to diagnose DSM-III-R alcohol/drug use disorders.

To check on the reliability of the CMRS ratings, 43 percent of all patients were also evaluated by an independent rater. Intraclass correlation coefficients, computed using the case 2 formula from Shrout and Fleiss (1979), indicated satisfactory reliability for all CMRS ratings (range: 0.58 for CMRS—Alcohol Lifetime, to 0.82 for CMRS—Drug Recent). CMRS—Alcohol ratings were collapsed to form three mutually exclusive groups: no history of alcohol use disorder (n = 34, 49%), past history of alcohol use disorder but not recent (past year) history (n = 16, 23%), and recent (past year) alcohol use dis-
order (n = 20, 28%). Similar categories were formed for the CMRS-Drug ratings: no history of drug use disorder (n = 35, 50%), past history of drug use disorder but not recent (past year) history (n = 17, 24%), and recent (past year) drug use disorder (n = 18, 26%). Chi-square analyses indicated that history of alcohol or drug use disorder (no history, past but not recent disorder, recent disorder) was not related to hospital (χ² = 5.48, 2.24, df = 2, p > 0.05).

Self-reported problems related to alcohol were assessed with the Michigan Alcoholism Screening Test (MAST; Selzer 1971). The MAST contains 24 yes/no questions pertaining to alcohol use and problems related to alcohol. Used extensively as a screening instrument in the general population, it has been found to discriminate schizophrenia patients with and without an alcohol use disorder (McHugo et al. 1993). To obtain a parallel measure of drug use, items from the MAST were adapted for the context of drug use. Two items referring specifically to alcohol-related problems were dropped (liver cirrhosis, delirium tremens), and three items related to drug use were added (arrest for sale of drugs, arrest for possession, physical problems related to drug use). The resultant instrument, the Michigan Drug Screening Test (MDST), is similar to Skinner's (1982) Drug Abuse Screening Test. The MAST and the MDST were given only to patients who had at least one drink or one incident of illicit drug use in their lifetime.

Procedure. Sequential admissions to MCP/EPPI were screened for project eligibility. Potentially eligible outpatients at MCP/EPPI and inpatients at Norristown were identified through hospital staff referral. Approximately 80 percent of the patients approached for the project agreed to participate. Unfortunately, information regarding the characteristics of patients who declined to participate was not obtained. Patients who provided informed consent were administered the instruments in the following order: MAST, MDST, DMM, DUMM, AEEQ, MEEQ, CEEQ, CMRS-Alcohol, and CMRS-Drug. The assessment was usually broken down into two or three meetings to avoid fatiguing the patient. Before completing all assessments, patients were assured that all information would be held strictly confidential and would not influence their treatment or discharge planning.

Results

The analyses were organized as follows. First, we examined the overlap between alcohol and drug use disorders. Second, we evaluated the correspondence between interview-based measures of substance use disorders and self-reported substance-related problems. Third, we calculated the internal reliabilities of the substance use expectancy and motives measures. Fourth, we determined the relationship between motives, expectancies, and history of substance use disorder. Last, we explored the relationship between motives, expectancies, and self-reported problems related to substance use.

Overlap of Alcohol and Drug Use Disorders. Based on the CMRS, a history of alcohol use disorder was present in 51 percent of the sample, and a history of drug use disorder was present in 50 percent. The overlap between lifetime history of drug use disorder and alcohol use disorder was very high, with only 11 subjects (16%) having a history of one type of substance use disorder but not the other (χ² = 32.94, df = 1, p < 0.001). Recent alcohol and drug use disorders were present in 29 and 26 percent of the sample, respectively. Similar to lifetime history of substance use disorder, recent alcohol use disorder was strongly related to recent drug use disorder (χ² = 17.23, df = 1, p < 0.001). In short, these data indicate a high comorbidity between alcohol and drug use disorders in this sample.

Interview-Based and Self-Reported Substance Use Problems. To evaluate the relationship between history of substance use disorders and self-reported problems, we first collapsed the history data obtained from the CMRS to form two categorical variables (three levels for alcohol = no alcohol use disorder/past alcohol use disorder/recent alcohol use disorder; and three levels for drugs = no drug use disorder/past drug use disorder/recent drug use disorder). For each variable, past substance use disorder referred to a history of disorder but not recent (past year) substance use disorder.

To evaluate whether past or recent alcohol use disorders were related to self-reported problems on the MAST and the MDST, two one-way analyses of variance (ANOVAs) were performed. Alcohol use disorder served as a between-subject factor, and the MAST and the MDST were the dependent variables. Both of these ANOVAs were statistically signifi-
cant \((F = 28.78, df = 2.55, p < 0.001; F = 12.99, df = 2.41, p < 0.001, \text{ respectively})\). Similar ANOVAs were performed to examine whether past or recent drug use disorders were related to the MAST and MDST. Both of these ANOVAs were also statistically significant \((F = 9.42, df = 2.55, p < 0.001; F = 44.41, df = 2.41, p < 0.001, \text{ respectively})\). In all cases, Tukey’s honestly significant difference (HSD) tests \((p < 0.05)\) indicated that the patients with no history of the relevant substance had lower self-reported problems than patients with a past or recent history, who did not differ. The descriptive statistics for the self-report ratings on the MAST and the MDST are shown in table 1.

**Table 1. MAST and MDST scores for schizophrenia patients with different histories of substance abuse**

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Alcohol</th>
<th>No alcohol abuse (N)</th>
<th>Past alcohol abuse (P)</th>
<th>Recent alcohol abuse (R)</th>
<th>No drug abuse (N)</th>
<th>Past drug abuse (P)</th>
<th>Recent drug abuse (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAST</td>
<td>12.93</td>
<td>(n = 23, SD = 2.39)</td>
<td>(n = 20, SD = 2.87)</td>
<td>(n = 14.69, SD = 4.59)</td>
<td>12.95</td>
<td>(n = 26, SD = 4.72)</td>
<td>(n = 15, SD = 4.91)</td>
</tr>
<tr>
<td>MDST</td>
<td>5.39</td>
<td>(n = 17, SD = 2.39)</td>
<td>(n = 15, SD = 3.95)</td>
<td>(n = 17, SD = 3.53)</td>
<td>12.43</td>
<td>(n = 26, SD = 2.48)</td>
<td>(n = 15, SD = 4.00)</td>
</tr>
</tbody>
</table>

Note—MAST = Michigan Alcoholism Screening Test \((p < 0.001)\); MDST = Michigan Drug Screening Test; SD = standard deviation.

**Internal Reliabilities of Expectancy and Motives Scales.** To evaluate whether the subscales of the expectancy and motives measures were internally reliable in a schizophrenia population, coefficient alphas were computed for each of the subscales. For the 17 subscales of the AEEQ, MEEQ, and CEEQ, coefficient alphas ranged from 0.55 (relaxation and tension reduction on the CEEQ) to 0.92 (global positive effects on both the CEEQ and the AEEQ), with a median coefficient alpha of 0.84.

For the six subscales of the DMM and DUMM, coefficient alphas ranged from 0.74 (socialization motives on the DMM) to 0.91 (pleasure enhancement motives on the DUMM), with a median coefficient alpha of 0.77. The internal reliabilities of the expectancy and motive subscales in this sample are comparable to those reported for these measures in the general population, suggesting acceptable
internal consistency (except for the DUMM, which has not been previously used).

Relationship of Substance Use Disorder to Expectancies and Motives. To evaluate whether past or recent alcohol use disorder (CMRS-Alcohol) was related to expectancies, three multivariate analyses of variance (MANOVAs) were performed, one for each expectancy scale (AEEQ, MEEQ, CEEQ). For each MANOVA, the independent variable was a history of alcohol use disorder (no history, past history, recent history) and the dependent variables were the subscales on each of the respective expectancy questionnaires (six for the AEEQ, six for the MEEQ, five for the CEEQ). The MANOVAs for the AEEQ and the MEEQ were statistically significant ($F = 2.05, df = 12,110, p < 0.05; F = 2.16, df = 12,112, p < 0.05$, respectively), but the MANOVA for the CEEQ was not. The descriptive statistics for the AEEQ and MEEQ subscales and for Tukey’s HSD tests are provided in Table 2. Inspection of this table shows that higher scores on all of the AEEQ subscales were related to history of alcohol use disorder, whereas only one MEEQ subscale was related to a history of alcohol use disorder.

The relationship between a history of drug use disorder and expectancies was examined by performing a similar set of three MANOVAs with drug use history (CMRS-Drug) as the independent variable. The multivariate group effect was significant for the MEEQ and the CEEQ ($F = 1.81, df = 12,112, p = 0.05; F = 2.05, df = 10,110, p < 0.05$, respectively), but not for the AEEQ. Tukey’s HSD tests indicated that three of the six MEEQ subscales were significantly different, and four of the five CEEQ subscales were different. Patients with a history of drug use disorder tended to have higher expectancies than did patients with no history. The descriptive statistics for the MEEQ and the CEEQ by drug use disorder group are presented in Table 3.

The relationship between a history of alcohol or drug use disorders and motives (the DMM and the DUMM) was explored in a series of MANOVAs similar to those described above. Both of the MANOVAs on history of alcohol use disorder were statistically significant ($F = 6.82, df = $).
Table 3. Means (standard deviations) on the MEEQ and CEEQ for patients with different histories of drug abuse

<table>
<thead>
<tr>
<th>MEEQ subscales</th>
<th>No drug abuse (N)</th>
<th>Past drug abuse (P)</th>
<th>Recent drug abuse (R)</th>
<th>Tukey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive and behavioral impairment</td>
<td>6.48 (4.19)</td>
<td>8.20 (3.78)</td>
<td>7.59 (3.87)</td>
<td>NS</td>
</tr>
<tr>
<td>Relaxation and tension reduction</td>
<td>3.74 (3.13)</td>
<td>5.93 (2.40)</td>
<td>4.29 (2.80)</td>
<td>NS</td>
</tr>
<tr>
<td>Social and sexual facilitation</td>
<td>3.71 (2.66)</td>
<td>5.93 (2.63)</td>
<td>5.00 (2.29)</td>
<td>P &gt; N2</td>
</tr>
<tr>
<td>Perceptual and cognitive enhancement</td>
<td>3.45 (2.59)</td>
<td>5.67 (1.95)</td>
<td>4.76 (2.68)</td>
<td>P &gt; N2</td>
</tr>
<tr>
<td>Global negative effects</td>
<td>4.03 (3.17)</td>
<td>4.67 (2.16)</td>
<td>4.00 (2.96)</td>
<td>NS</td>
</tr>
<tr>
<td>Craving and physical effects</td>
<td>2.74 (2.05)</td>
<td>4.80 (1.37)</td>
<td>4.35 (1.97)</td>
<td>P, R &gt; N3</td>
</tr>
<tr>
<td>CEEQ subscales</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global positive effects</td>
<td>5.41 (4.86)</td>
<td>10.56 (4.18)</td>
<td>6.69 (4.94)</td>
<td>P &gt; N2</td>
</tr>
<tr>
<td>Global negative effects</td>
<td>8.07 (5.48)</td>
<td>12.06 (2.69)</td>
<td>8.25 (4.49)</td>
<td>P &gt; N5</td>
</tr>
<tr>
<td>General arousal</td>
<td>3.79 (2.99)</td>
<td>6.56 (1.67)</td>
<td>5.31 (2.63)</td>
<td>P &gt; N2</td>
</tr>
<tr>
<td>Anxiety</td>
<td>3.41 (2.64)</td>
<td>5.25 (1.44)</td>
<td>4.56 (2.22)</td>
<td>P &gt; N5</td>
</tr>
<tr>
<td>Relaxation and tension reduction</td>
<td>1.24 (1.24)</td>
<td>1.81 (1.22)</td>
<td>1.44 (1.26)</td>
<td>NS</td>
</tr>
</tbody>
</table>

Note.—MEEQ = Marijuana Effect Expectancy Questionnaire (Schafer and Brown 1991); CEEQ = Cocaine Effect Expectancy Questionnaire (Schafer and Brown 1991); NS = not significant.

1Multivariant $F = 1.81, df = 12,112, p < 0.05$.
2$p < 0.01$.
3$p < 0.001$.
4Multivariant $F = 2.05, df = 10,110, p < 0.05$.
5$p < 0.05$.

6,110, $p < 0.001$; DUMM, $F = 2.16, df = 6,82, p = 0.05$), as were both of the MANOVAs on history of drug use disorder (DMM, $F = 3.06, df = 6,110, p < 0.01$; DUMM, $F = 2.98, df = 6,82, p = 0.01$). The descriptive statistics for these measures and for Tukey's HSD tests are summarized in tables 4 and 5. As with the expectancies, patients with a history of alcohol or drug use disorder tended to endorse motives more strongly than did patients with no substance use disorder history.2

Relationship of Self-Reported Substance Use Problems With Expectancies and Motives. To evaluate whether patients who reported more problems related to alcohol (MAST) or drugs (MDST) also reported stronger expectancies (AEEQ, MEEQ, CEEQ) and motives (DMM, DUMM) for alcohol or drug use, Pearson correlations

2Additional analyses were conducted to evaluate whether the same pattern of results would be obtained if the patients with chronic schizophrenia (assessed at Norristown State Hospital) were excluded. To address this question, the 14 MANOVAs (previously described) evaluating the relationships between alcohol- or drug-related problems (MAST, MDST), expectancy (AEEQ, MEEQ, CEEQ), motives (DMM, DUMM), and history of alcohol or drug use disorder (never, past, recent) were repeated, dropping the chronic patients. The pattern of results obtained was similar but not identical to that found with the entire sample. Similar to the findings with the entire sample, a history of alcohol use disorder was related to MAST, MDST, AEEQ, and DMM, and a history of drug use disorder was related to MAST, MDST, and marginally ($p < 0.1$) CEEQ. Also similar to findings with the entire sample, a history of alcohol use disorder was not related to CEEQ, and a history of drug use disorder was not related to AEEQ. However, in contrast to the previous findings, a history of alcohol abuse was not related to MEEQ or DUMM, and a history of drug abuse was not related to MEEQ, DMM, or DUMM. Thus, 10 out of the 14 MANOVAs (including CEEQ and drug abuse) in the restricted sample produced the same findings as in the complete sample. The failure of some MANOVAs to achieve significance appears to be at least partly owing to the reduced power in the subsample analyses, in which the sample size was reduced from 70 to 51 patients.
Table 4. Means (standard deviations) on the DMM and DUMM for patients with different histories of alcohol abuse

<table>
<thead>
<tr>
<th></th>
<th>No alcohol abuse (N)</th>
<th>Past alcohol abuse (P)</th>
<th>Recent alcohol abuse (R)</th>
<th>Tukey</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMM subscales¹</td>
<td>(n = 24)</td>
<td>(n = 16)</td>
<td>(n = 19)</td>
<td></td>
</tr>
<tr>
<td>Socialization</td>
<td>9.42 (3.20)</td>
<td>13.62 (3.48)</td>
<td>13.16 (3.76)</td>
<td>P, R &gt; N²</td>
</tr>
<tr>
<td>Coping</td>
<td>8.04 (3.25)</td>
<td>11.19 (4.00)</td>
<td>13.84 (3.67)</td>
<td>P, R &gt; N²</td>
</tr>
<tr>
<td>Pleasure enhancement</td>
<td>8.12 (3.40)</td>
<td>14.19 (4.71)</td>
<td>13.79 (3.60)</td>
<td>P, R &gt; N²</td>
</tr>
<tr>
<td>DUMM subscales³</td>
<td>(n = 10)</td>
<td>(n = 16)</td>
<td>(n = 19)</td>
<td></td>
</tr>
<tr>
<td>Socialization</td>
<td>9.58 (4.25)</td>
<td>12.25 (3.70)</td>
<td>10.76 (4.16)</td>
<td>NS</td>
</tr>
<tr>
<td>Coping</td>
<td>8.08 (2.87)</td>
<td>10.44 (3.52)</td>
<td>12.06 (4.23)</td>
<td>R &gt; N¹</td>
</tr>
<tr>
<td>Pleasure enhancement</td>
<td>10.17 (5.46)</td>
<td>14.69 (4.45)</td>
<td>13.47 (4.62)</td>
<td>P &gt; N²</td>
</tr>
</tbody>
</table>

Note.—DMM = Drinking Motives Measure (Cooper et al. 1992b); DUMM = Drug Use Motives Measure; NS = not significant.

¹Multivariate F = 6.82, df = 6,110, p < 0.001.
²p < 0.001.
³Multivariate F = 2.16, df = 6,82, p < 0.05.
⁴p < 0.05.

Table 5. Means (standard deviations) on the DMM and DUMM for patients with different histories of drug abuse

<table>
<thead>
<tr>
<th></th>
<th>No drug abuse (N)</th>
<th>Past drug abuse (P)</th>
<th>Recent drug abuse (R)</th>
<th>Tukey</th>
</tr>
</thead>
<tbody>
<tr>
<td>DMM subscales¹</td>
<td>(n = 27)</td>
<td>(n = 16)</td>
<td>(n = 16)</td>
<td></td>
</tr>
<tr>
<td>Socialization</td>
<td>10.33 (4.05)</td>
<td>12.50 (3.72)</td>
<td>13.44 (3.20)</td>
<td>R &gt; N²</td>
</tr>
<tr>
<td>Coping</td>
<td>9.26 (4.32)</td>
<td>11.31 (3.50)</td>
<td>12.75 (4.39)</td>
<td>R &gt; N²</td>
</tr>
<tr>
<td>Pleasure enhancement</td>
<td>9.07 (4.00)</td>
<td>13.75 (4.20)</td>
<td>13.69 (4.67)</td>
<td>P, R &gt; N³</td>
</tr>
<tr>
<td>DUMM subscales³</td>
<td>(n = 13)</td>
<td>(n = 16)</td>
<td>(n = 16)</td>
<td></td>
</tr>
<tr>
<td>Socialization</td>
<td>9.23 (4.60)</td>
<td>11.81 (4.00)</td>
<td>11.56 (3.46)</td>
<td>NS</td>
</tr>
<tr>
<td>Coping</td>
<td>7.00 (1.96)</td>
<td>11.25 (3.15)</td>
<td>12.37 (4.13)</td>
<td>P, R &gt; N³</td>
</tr>
<tr>
<td>Pleasure enhancement</td>
<td>10.31 (6.14)</td>
<td>13.56 (4.72)</td>
<td>14.69 (3.48)</td>
<td>P &gt; N²</td>
</tr>
</tbody>
</table>

Note.—DMM = Drinking Motives Measure (Cooper et al. 1992b); DUMM = Drug Use Motives Measure; NS = not significant.

¹Multivariate F = 3.06, df = 6,110, p < 0.01.
²p < 0.05.
³p < 0.001.
⁴Multivariate F = 2.98, df = 6,82, p < 0.05.

were computed between the two sets of measures. There are a total of 17 subscales for the expectancy measures and 6 subscales for the motives measures, yielding a total of 23 subscales. Each subscale was correlated with the MAST and the MDST. Of the 46 computed correlations, 2—the MAST and the relaxation and tension reduction subscale of the CEEQ (r = 0.12) and the MDST and the relaxation and tension reduction subscale of the CEEQ (r = 0.21)—were nonsignificant (p > 0.05). The remaining 44 correlations ranged between 0.26 and 0.65, with a median of 0.51. Thus, problems that patients perceived to be due to the use of alcohol or drugs were strongly related to patients’ expectations and motives for substance use.

Demographic and Chronicity Correlates of Substance Use Disorders. A series of analyses was conducted to evaluate whether any of the following demographic or clinical variables—sex, race, age, number of prior hospitalizations,
and age at onset of schizophrenia symptoms—were related to substance use disorders. (Age at onset of alcohol or drug abuse symptoms was not examined because this variable was available for only a subset of patients—those with alcohol or drug use disorders.) For sex and race, separate chi-square analyses were conducted to determine whether each variable was related to a history (never, past, recent) of alcohol or drug use disorder. None of these four analyses was significant ($p > 0.1$), suggesting that these demographic characteristics were not related to a history of substance use disorder.

To evaluate whether age, number of hospitalizations, or age at onset of schizophrenia symptoms was related to substance use disorder, one-way ANOVAs were conducted on each variable, separately, for alcohol and drug abuse history. For each ANOVA, age, age at onset, or number of prior hospitalizations was the dependent variable, and a history of alcohol (or drug) use disorder (never, past, recent) was the independent variable. One of these six ANOVAs was significant: age at onset of schizophrenia symptoms and history of alcohol use disorder ($F = 3.21$, $df = 2.60$, $p < 0.05$). A post hoc Tukey HSD test indicated that patients with a past history of alcohol abuse had an earlier age at onset of schizophrenia symptoms than patients with no history (means = 19.37 and 24.39 years, respectively), whereas patients with a recent history of alcohol abuse (mean = 21.26 years) did not differ significantly from either group.

Subsequent exploratory MANOVAs included age at onset of schizophrenia symptoms as a covariate in analyses examining the relationship between history of alcohol use disorder and expectancies (AEEQ, MEEQ, CEEQ) or motives for use (DMM, DUMM). The results were significantly different for only one of these five MANOVAs: the multivariate effect for history of alcohol use and the AEEQ was no longer statistically significant ($p < 0.2$). A minor difference was that the multivariate effect for the MEEQ was only marginally significant ($p = 0.07$), whereas when age at onset of schizophrenia symptoms was not included as a covariate, the effect was significant at the $p < 0.05$ level. These findings suggest that differences in age at onset of schizophrenia symptoms did not mediate the observed relationships between history of alcohol abuse, and expectancies and motives for use.

**Discussion**

The internal reliabilities of the expectancies and motives were satisfactory for all subscales. These findings are consistent with other reports of the internal reliability or item coherence within a scale (based on factor analysis) in the general population and among primary substance abusers (Brown et al. 1987; Schafer and Brown 1991; Cooper et al. 1992b). These data are, to our knowledge, the first reliability reports for these measures in a schizophrenia population or, for that matter, a primary psychiatric population. Future research on these instruments needs to examine their test-retest reliability to determine whether they measure stable, trait-like dimensions, as hypothesized by expectancy and motive theories of substance use.

Analyses examining the relationship between alcohol or drug use disorder and expectancies and motives for substance use provide some support for the validity of the expectancies and motives measures. Patients with a history of alcohol use disorders reported higher expectancies for the effects of substances and more motives for using substances than did patients with no such history. These effects were consistent across the subscales of the AEEQ, but were present for only one of six MEEQ subscales and for none of the CEEQ subscales. Regarding a history of drug use disorders, an opposite pattern emerged, with effects present across four of the five CEEQ subscales, less consistent across the MEEQ subscales (three of the six), and present for none of the AEEQ subscales. The differential association between substance abuse and the expectancies for effects of different substances is particularly noteworthy considering the overlap of patients with alcohol and drug use disorders. Thus, there was an association between a history of alcohol or drug use disorder and an elevation in expectancies for those same substances.

The finding that schizophrenia patients with a history of alcohol or drug use disorder endorsed stronger expectations for the effects of those substances is consistent with prior studies on persons with a primary substance use disorder (Brown et al. 1985, 1987; Schafer and Brown 1991). Previous studies, however, have not measured multiple substance use histories or multiple expectancies; therefore, they have not provided evidence for true substance-specific effects (i.e., expectancies for one type of substance related to a history of use of that substance but not of another substance). For example, the finding that alcohol expectan-
cies in this sample were related to a history of alcohol use disorder but not of drug use disorder is evidence in support of a substance-specific association. Additional research on the expectancies of groups of patients who do not overlap in their alcohol or drug use histories (e.g., comparisons of patients with a history of alcohol abuse but not of drug abuse with patients with a history of drug abuse but not of alcohol abuse) would provide further support for the specificity of expectations for different types of substances. Such an analysis could not be conducted in the present study because of the limited sample size.

Higher motives for using alcohol (DMM) were related to a history of both alcohol and drug use disorders. The parallel version we employed to assess drug use motives (DUMM) was also related to both alcohol and drug use disorders in the expected direction. Thus, in contrast to the pattern for expectancies, substance-specific effects for motives were not observed. Cooper et al. (1992a) reported that the DMM was related to a history of alcohol use symptoms in the general population. Our data raise the possibility that motives for using drugs are related to symptoms of alcohol abuse. However, these data must be interpreted with caution because the validity of the measure of motives for drug use employed here (DUMM) has not yet been established. Furthermore, the overlap between the alcohol and drug use disorder groups may have made it less likely to detect substance-specific motives on these measures. Nevertheless, the differential pattern of associations between the expectancies and motives scales and a history of substance use disorder supports the distinctiveness of these two constructs. In addition, it raises the question of whether the assessment of expectancies for the effects of alcohol and drugs might mediate the use of specific substances.

These findings raise questions about the relationship between motives, expectancies, and substance use behavior in patients with schizophrenia. One hypothesis is that motives are the driving or proximate explanation underlying substance use, whereas expectancies are correlated with the specific types of substances used. It is interesting that socialization, coping, and pleasure-enhancement motives were all strongly related to a history of alcohol use disorders, whereas only coping motives were strongly related to a history of drug abuse. Cooper et al. (1992a) reported in a large community sample that drinking to cope with negative emotions was more strongly associated with alcohol-related problems than was drinking for socialization or pleasure enhancement. The present data suggest that in schizophrenia, a similar relationship is found between drug use motivated by coping with negative emotions and drug-related problems. At the same time, while problematic drug use may be primarily motivated by efforts to cope, patients are aware of (and develop expectancies for) a range of other positive (as well as negative) effects of drug use. The results reported here are consistent with the hypothesis that motives are the more proximate determinant of substance use behavior, although the data are not well suited to evaluate this possibility.

Examination of demographic and clinical correlates of substance use disorders revealed few significant associations, perhaps partly because of the modest sample size. The one significant finding, out of 10 statistical analyses indicating that age at onset of schizophrenia symptoms was earlier in patients with a history of alcohol use disorders, could simply be a chance finding. Other data on age at onset of schizophrenia and alcoholism are mixed, with some studies finding an earlier onset in patients with alcohol use disorders (Alterman et al. 1984) but most reporting no differences (Bernadt and Murray 1986; Hays and Aidroos 1986; Barbee et al. 1989; Mueser et al. 1990). Regardless of the replicability of this result, inclusion of age at onset as a covariate in analyses examining the relationship between a history of alcohol use disorder and expectancies and motives resulted in few changes, suggesting that age at onset was not a critical mediating variable.

Patients with a history of recent or past alcohol use disorders reported more problems related to the use of drugs or alcohol on the MAST and MDS than did patients with no such history. Similarly, patients with past or recent drug use disorders also had elevations on the MAST and MDS. Previous research on the MAST with a schizophrenia sample has also shown that self-reported problems related to alcohol are associated with a history of alcohol use disorders (McHugo et al. 1993). Evidence that a history of alcohol or drug use disorders is associated with problems for both the same and a different substance type reflects the high rate of comorbidity for alcohol and drug use disorders in this sample. This is in line with findings from other surveys of
substance use disorders in schizophrenia (Mueser et al. 1990; Regier et al. 1990). Since the same pattern of results was observed for both the MAST and the MDST, these data suggest that the MDST, developed for the purpose of this study, may have the same properties (i.e., validity) as the MAST. The MDST results reported here, however, are in need of replication.

Our data suggest that in schizophrenia and schizoaffective disorder, where there is a high rate of both alcohol and drug use disorders, strong substance-specific expectations may be present. That is, experience with the distinct effects of different substances may cause divergent expectations to develop, which may play a role in subsequent use (and abuse) of those substances. In contrast, motives appear associated with either an alcohol or a drug use disorder, suggesting that they do not play a role in substance choice. Similarly, self-reported problems were related nonspecifically to both expectations and motives. These data suggest that expectancy and motive questionnaires, although developed for the primary substance abuse population, may be valid for psychiatric populations. Research on motives and expectancies may help to clarify the functions of substance use in persons with schizophrenia, leading to better treatments. For example, patients whose primary substance abuse is motivated by attempts to cope with negative affect may benefit from learning alternative strategies for coping with these negative feelings, whereas patients whose substance abuse is primarily motivated by social facilitation may require help establishing different social networks or social skills for resisting overtures to use drugs or alcohol. In this sense, identifying individual differences in expectancies and motives may lead to the development of more targeted interventions for substance use disorders in this population.

References


**Acknowledgments**

Portions of this research were presented at the 27th Annual Convention of the Association for the Advancement of Behavior Therapy in Atlanta, GA, in 1994 and at the Conference on Comorbidity Between Psychiatric Disorders and Addictive Behavior in Hamburg, Germany, in 1993.

The authors thank Jack J. Blandard for valuable discussions about this topic; Richard C. Josiassen for providing access to patients and staff at the MCP Research Unit at Norristown State Hospital; Sandra K. Brown for the expectancy scales; Lynne Cooper for information concerning administration of the Drinking Motives Measures; and Janet Holec, Sylvia Gratza, Linda Roth, and Ruthanne Vendy for their help in other aspects of the study.

**The Authors**

Kim T. Mueser, Ph.D., is Associate Professor, Departments of Psychiatry and Community and Family Medicine, Dartmouth Medical School, Concord, NH. Pallavi Nishith, Ph.D., is Assistant Research Professor of Psychology, University of Missouri, St. Louis. MO. Joseph I. Tracy, Ph.D., is Assistant Professor of Psychiatry, and Joanne DeGirolamo, B.A., is a Research Assistant, Medical College of Pennsylvania, Philadelphia, PA. Max Molinaro, M.Ed., is Staff Psychologist, Catch, Inc., Philadelphia, PA.