We examined the relation of self-appraised social problem-solving abilities and personality-disorder characteristics to the adjustment and compliance of persons with dual diagnoses in substance-abuse treatment. It was hypothesized that elements of the problem-orientation component would remain predictive of depressive behavior and distress after considering personality-disorder characteristics among 117 persons receiving inpatient-substance-abuse treatment. Furthermore, self-appraised problem-solving abilities were expected to predict the occurrence of "dirty" drug and alcohol screens during treatment and compliance with the first scheduled community follow-up visit. Results supported predictions concerning the relation of problem-solving confidence to depressive behavior, distress, and substance-use screens; however, a paradoxical relation was observed between the problem-orientation variables and compliance with the first outpatient visit. The results are interpreted within the context of contemporary models of social problem solving and the implications for cognitive-behavioral assessment and intervention are considered. © 2001 John Wiley & Sons, Inc.

Keywords: social problem solving; dual diagnosis; personal disorder

This study was supported by a grant to the first author by the Student Research Award in Public Substance Abuse Services, Department of Mental Health, Mental Retardation, and Substance Abuse Services, Commonwealth of Virginia.

The authors appreciate the statistical advice provided by Michael De Vivo.

Correspondence concerning this article should be addressed to: Timothy R. Elliott, 1717 Sixth Avenue South, 530 Spain Rehabilitation Center, University of Alabama at Birmingham, Birmingham, AL, 35233–7330; e-mail: telliott@uab.edu.
Social-cognitive models of substance abuse stipulate that abuse is likely when an individual possesses inadequate coping skills (Marlatt, Baer, Donovan, & Kivlahan, 1988). Generally, addictive behaviors are construed as socially acquired behaviors influenced by past learning, situational antecedents, biological dispositions, cognitive processes, and reinforcement contingencies (MacKay, Donovan, & Marlatt, 1991). Substance abuse may then be seen as ineffective attempts to cope with problem situations, as these behaviors may represent the extent of an existing coping repertoire (MacKay et al., 1991) or a habitual, over-learned coping style (Marlatt, 1979). Interventions that incorporate training in self-control, social skills, stress management, and problem solving address social-cognitive characteristics are essential in recovery and in coping with concomitant social, personal, and health problems that accompany abuse (Miller, 1992; Miller & Brown, 1997).

It has been believed for some time that social-problem-solving competencies are implicated in the prevention, development, and rehabilitation of addictive behaviors (Marlatt, 1979; p. 342). Indeed, descriptive research has demonstrated that persons progressing well in recovery programs evidence more skills in problem-solving scenarios (Appel & Keastner, 1979; Intagliata, 1978). More recent research indicates that families with adolescents who abuse substances often lack skills in family problem solving and in coping with everyday problems (Hops, Tildesley, Lichtenstein & Ary, 1990). The tendency to avoid actively coping with life problems also has been associated with alcohol use among young adults (Cooper, Russell, Skinner, & Frone, 1992; Fromme & Rivet, 1994), older problem drinkers (Moos, Brennan, Fondacaro, & Moos, 1990), and college students (Evans & Dunn, 1995).

Several studies of self-appraised problem-solving abilities also have revealed a link between problem-solving competencies and substance use. Self-appraised ineffective problem solving has been related to retrospective accounts of substance use among undergraduates (Elliott, Johnson & Jackson, 1997; Heppner, Hibel, Neal, Weinstein, & Rabinowitz, 1982; Williams & Kleinfelter, 1989) and adult children of alcoholics (Wright & Heppner, 1991). More specifically, greater tendencies to avoid problem-solving situations have been prospectively predictive of greater alcohol intake among undergraduates over a two-week period (Godshall & Elliott, 1997).

Despite this supportive evidence, other research has found contradictions in the supposed relation of social problem solving to addictive behavior. For example, Larson and Heppner (1989) found men receiving inpatient treatment for alcohol addiction were more negative than comparison groups in their self-report of problem-solving abilities, but these reports were unrelated to severity of alcohol abuse. Moreover, preliminary evidence suggests that problem-solving interventions for persons receiving treatment for dual-diagnosed disorders may not be particularly effective (Carey, Carey, & Meisler, 1990). Although the reasons for these discrepancies are unclear, it is possible that the unique characteristics of persons in substance-abuse treatment programs may confound our understanding of problem-solving mechanisms in adaptive behavior. Persons in substance-abuse treatment programs often meet clinical criteria for some coexisting behavioral disorder and thus are described as “dual-diagnosis” cases (Polcin, 1992). It may be enlightening to consider the potential challenges persons with dual diagnoses present to social-cognitive models of substance abuse, assessment, and treatment.

Persons with a “dual diagnosis” account for a large percentage of the persons with chronic behavioral disorders participating in public programs, and the number who fit this diagnosis, appears to be increasing (Polcin, 1992). Regardless of diagnostic categories and the type of substance abused, dually diagnosed persons have poor treatment responses (Brady et al., 1990; Lieberman, Kinon, & Loebel, 1990). In addition, a variety of treatment complications have been noted with persons who meet criteria for dual
diagnoses. For example, Osher and Kofod (1989) and Bowers, Mazure, Nelson, and Jatlow (1990) provided evidence that dual-diagnosis individuals are less responsive to psychiatric medications than those with other chronic behavior disorders. Furthermore, dually diagnosed persons do poorer than others on measures related to rehospitalization and treatment noncompliance (Drake & Wallach, 1989; McCarrick, Manderschied, & Bertolucci, 1985). However, theoretical investigations examining the factors associated with these outcomes measures are lacking (Minkoff, 1989).

Several studies have examined patterns between diagnoses, compliance, recovery, and psychosocial adjustment. Wolpe, Gorton, Serota, and Sanford (1993) found persons with a diagnosis of cocaine dependence and/or any kind of depressive syndrome were more likely to be noncompliant with aftercare programs, and they displayed more erratic patterns of gaining and losing in-house privileges. Dual-diagnosis individuals are more likely to be rehospitalized within a 90-day period following discharge (Lyons & McGovern, 1989), and these persons have an annual rate of psychiatric hospitalizations two to three times greater than the rate observed among persons with other chronic disorders matched on diagnostic categories (Safer, 1987). Dually diagnosed persons seem different from their non-substance-abusing counterparts along several important dimensions. Persons with dual diagnoses tend to be younger, more likely to be diagnosed with personality disorders, less likely to be classified as schizophrenic, and are hospitalized for briefer periods. They also are more apt to exhibit suicidal, homicidal, destructive, and irresponsible behaviors than persons who do not meet criteria for dual diagnoses (Kay, Kalathora, & Meinzer, 1989; McCarrick et al., 1985).

To a great extent, research-linking self-appraised problem-solving abilities to addictive behavior largely has occurred in studies of undergraduate students (e.g., Godshall & Elliott, 1997), and contradictory findings have been observed among clinical samples (e.g., Larson & Heppner, 1989). We suspect that the unique characteristics of dually diagnosed patients may mediate the relations between social-problem-solving abilities and adaptive behavior in this population. For example, most dual-diagnosed persons meet criteria for some personality disorder, and these characteristics may be implicated in poorer outcomes among these persons (Kay et al., 1989; McCarrick et al., 1985). Unfortunately, there is no research to date that has examined the possible confounding effects of personality-disorder characteristics in the association between social-problem-solving abilities and adjustment. There is some preliminary evidence that dual-diagnosis persons might have problem-solving deficits, but it remains unclear if these deficits are related to adjustment (Carey & Carey, 1990). In fact, it is possible that different personality-disorder characteristics may be associated with different self-appraisals of problem-solving ability. In order for us to consider social-problem-solving modalities as adjuncts to treatment programs, it is imperative that we first establish a link between the self-appraised social-problem-solving abilities and adjustment among persons with dual diagnoses, taking into account personality-disorder characteristics.

Hypotheses

We examined several issues in this study. First, we needed to ascertain the relations between personality-disorder characteristics and self-appraised social-problem-solving abilities among participants in a substance-abuse treatment program for persons with dual diagnoses. We expected self-appraised problem-solving abilities would be correlated significantly with personality-disorder characteristics. We suspected, for example, that persons with dramatic, highly emotional characteristics associated with Cluster B disorders (e.g., histrionic, antisocial, borderline, etc.; American Psychiatric Association,
1987) might exaggerate their self-reported abilities in an attempt to appear competent or to be manipulative. In contrast, persons with characteristics associated with Cluster C disorders (e.g., dependent, self-defeating, etc.) might be more pessimistic and negative in their self-reported competencies. Therefore, we examined possible differences in self-appraised problem-solving abilities by personality-disorder cluster.

Second, we investigated the relation of social-problem-solving abilities to measures of psychological adjustment, taking into account the relation of personality characteristics to each index of adjustment. The problem-orientation component of the social-problem-solving model is implicated in the development of psychological distress (D’Zurilla & Nezu, 1990; Nezu, 1987; Nezu & D’Zurilla, 1989). The Problem Solving Confidence (PSC) factor on the Problem Solving Inventory (PSI; Heppner, 1988) can be construed as an element of the positive-orientation component described by D’Zurilla and colleagues. Previous research has demonstrated that it operates in a fashion congruent with the theoretical properties of the positive-problem-solving orientation (see Elliott, Herrick, McNair, & Harkins, 1994; Elliott, Sherwin, Harkins & Marmarosh, 1995). Of the three PSI scales, the Problem Solving Confidence (PSC) factor has emerged in several studies as the best single best predictor of depressive behavior and distress under routine and stressful conditions over time (Dixon, Heppner, & Anderson, 1991; Priester & Clum, 1993). Therefore, we expected the PSC factor to be predictive of depressive behavior and distress at admission to the program, after considering personality characteristics and the two remaining problem-solving variables measured by the PSI.

Finally, we examined the prospective relations of self-appraised problem-solving abilities to indices of treatment adherence. Past research has demonstrated that effective problem solving is associated with adaptive habits, attitudes, and health behaviors (Elliott, Godshall, Shrout, & Witty, 1990; Elliott et al., 1997; Godshall & Elliott, 1997). Persons with effective social-problem-solving abilities would be expected to demonstrate greater motivation and more positive attitudes toward program policies and recommendations for appropriate behavior. We expected persons with more effective problem-solving abilities would demonstrate greater compliance with program recommendations for maintaining abstinence during the course of treatment. Therefore, we collected the results of urine and breathalyzer tests of illicit drug and alcohol use during the treatment program. We also collected data on the number of persons who observed treatment recommendations to keep their first community outpatient visit with an assigned counselor one-month post discharge. We expected effective problem-solving abilities would be prospectively predictive of clean substance-use screen analyses and with attendance at the community outpatient visit regardless of characterological tendencies.

Method

Participants and Procedure

Participants were enrolled in a dual-diagnosis treatment program at a state psychiatric facility. Participants had a primary Axis I or Axis II (DSM-III-R) diagnosis indicating a major behavioral disorder (e.g., affective disorder, personality disorder) and a coexisting substance-abuse disorder (e.g., alcoholism, chemical dependency). Persons were admitted to the program via a transfer from a brief treatment program (approximately one to two weeks) for physiological withdrawal and psychological stabilization. The dual-diagnosis program admitted and discharged patients on a “rolling” basis with a continuous census ranging from 30 to 75 persons. The program subscribed to a 30-day model of treatment, followed by placement into the community with continued care.
Persons admitted over an eight-month period were approached individually at admission and asked to participate in a study of individual differences in dual-diagnosis treatment. Informed consent was obtained to collect data and access patient files. Participants completed a series of self-report measures. The treatment, diagnostic, and demographic variables were collected from hospital records.

Of 150 patients approached, 27 refused or did not complete the forms (23 men, 4 women). Five people stated they could not read, and one woman was too psychiatrically unstable to complete the forms. This left a sample of 117 usable subjects. This sample was predominately male \( (N = 90) \) and Caucasian \( (N = 71) \). The sample also included persons of African American \( (N = 45) \) and Hispanic \( (N = 1) \) ethnicity. The average age was 33 years \( (SD = 8.1) \) and the average length of stay in the program was 44 days \( (SD = 25.8) \). Eighty-three percent were unmarried \( (N = 97) \), meaning that these persons were either divorced or never married.

**Predictor Variables**

**Social-Problem-Solving Abilities.** The Problem Solving Inventory Form A (PSI; Heppner, 1988) was used to measure self-appraised problem-solving abilities. The PSI contains 32 items that are rated on a 6-point Likert-type scale ranging from 1 (strongly agree) to 6 (strongly disagree). The PSI contains three factors described earlier: problem-solving confidence, approach–avoidance, and personal control (Heppner, 1988). Reliability estimates revealed that these constructs are internally consistent (\( \alpha \)'s from .72 to .90) and stable over a two-week period (test–retest correlations from .83 to .89; Heppner, 1988). Validity estimates indicated that the PSI subscales are related significantly in predicted directions with a variety of self-report and observational measures (Heppner, 1988). Higher scores indicate negative perceptions of one’s problem-solving ability. We used the three scale scores separately as predictor variables.

**Personality-Disorder Characteristics.** The Millon Clinical Multiaxial Inventory—II (MCMI-II; Millon, 1987) was used to assess personality-disorder characteristics. The MCMI-II has 175 items that are answered in a true–false format. The MCMI-II was developed to assess personality disorders according to the DSM-III-R diagnostic framework (Millon, 1987). The diagnostic scales on the MCMI-II are interpreted according to “base rates” that parallel-clinical-prevalence rates for each disorder. Base-rate scores greater than 75 indicate a presence of characteristics on a given scale generally consistent with the corresponding personality-disorder diagnosis. The personality scales also are grounded in Millon’s personality model in which characterological styles are described in terms of biological predispositions and learning experiences (Millon & Klerman, 1986).

The MCMI-II has 13 scales that coincide with DSM-III-R personality-disorder categories, including the Cluster A disorders (Paranoid, Schizoid, and Schizotypal), Cluster B disorders (Antisocial, Borderline, Aggressive–Sadistic, Narcissistic, and Histrionic), and Cluster C disorders (Compulsive, Dependent, Passive–Aggressive, and Self-Defeating). These scales assess long-standing features and current presentation of each dimension of the respondent’s personality style. The Cluster A category, as described in the DSM-III-R (American Psychiatric Association, 1987, p. 335), encompasses a constellation of characteristics that often share an “odd or eccentric” quality in presentation. The Cluster B characteristics often share “dramatic, emotional, or erratic” features. Finally, the Cluster C category describes disorders that often appear “anxious or fearful.”

The personality-disorder scales on the MCMI-II have received considerable empirical attention. Millon (1987) reports reliability coefficients for the 13 scales ranging from
.77 to .85 over a four- to six-week period (N = 86). Millon (1987, p. 124) contends that reliabilities are consistently higher among “heterogeneous psychiatric populations.” Internal-consistency estimates for the 13 scales range from .86 to .83 (Millon, 1987, p. 129).

There has been some concern regarding the external validity of the 13 scales despite supportive evidence comparing MCMI-II profiles with clinician ratings and with scores on other established self-report measures (e.g., the MMPI, Millon, 1987). The concerns appear to be due, in part, to the fairly high interscale correlations among the 13 scales, and the unclear and somewhat atheoretical nature of the present taxonomy of personality-disorder classifications. To address this problem and to restrict our number of variables for meaningful correlational analyses and interpretation, we restricted our use of the MCMI-II to three variables that would specifically reflect Cluster A, B, and C characteristics for each respondent. The 13 scale scores were collapsed into the three broad clusters delineated in the DSM-III-R. Thus, the base-rate scores on the three scales comprising the Cluster A category (Schizoid, Schizotypal, and Paranoid) were summed and divided by three to obtain a general index of Cluster A characteristics. Similarly, the base-rate scores from the five scales measuring Cluster B tendencies (Narcissistic, Antisocial, Histrionic, Borderline, and Aggressive–Sadistic) were summed and divided by five to obtain a single index of these characteristics. The five scales assessing behaviors associated with the Cluster C dimensions (Compulsive, Avoidant, Dependent, Self-Defeating, Passive–Aggressive) were summed and divided by five to obtain an index of these characteristics.

We adhered to conservative recommendations for determining valid profiles for use. Profiles that had a validity index of 0 (indicating a “valid profile”; Millon, 1987, p. 195) were retained for analysis. Profiles with index scores of 1 (“questionable validity”) or 2 or more (“invalid”) were discarded. This procedure is recommended to delete profiles that might be contaminated by “careless, confused, or random responding” (Millon, 1987, p. 196). Furthermore, we examined the raw score of Scale X as an additional safeguard. The raw score of Scale X assesses the applicability and degree of a disclosure correction, taking into consideration tendencies to be guarded or hesitant or conversely, an exaggerated or unusually open response style. A Scale X raw score less than 145 or greater than 590 indicates that the profile is probably invalid (Millon, 1987, p. 196). Thus, profiles meeting these criteria were retained for analysis.

**Criterion Variables**

**Depressive Behavior.** The Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) is a 21-item questionnaire measuring cognitive, somatic, and behavioral symptoms of depressive behavior. Each item is rated on a 4-point scale with higher scores indicating a more intense display. The BDI has demonstrated adequate internal consistency (α = .86) and adequate construct validity with inpatient psychiatric populations (Beck, 1972).

**Distress.** The Brief Symptom Index (BSI; Derogatis & Spencer, 1982) contains 53 items that list symptoms related to various aspects of psychopathology. Respondents note the degree to which they are distressed by each symptom on a 0 (not at all) to 4 (extremely) scale. Subtests include somatization, obsessive–compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. Three global indices provide an assessment of the intensity of perceived distress, the number of symptoms experienced, and a summary measure combining intensity and the number of
symptoms. Coefficient alphas suggest adequate stability ranging from .77 for the psychoticism subscale to .90 for the depression subscale. Test–retest-reliability coefficients for the BSI symptom dimensions range from .68 for the somatization dimension to .91 for phobic anxiety. For the general indices, the test–retest reliabilities for the Global Severity Index (GSI), the Positive Symptom Distress Index (PSDI), and the Positive Symptom Total (PST) were .90, .87, and .80, respectively (Derogatis & Spencer, 1982). The measure has been validated on several measures of psychopathology and clinical ratings (Derogatis & Spencer, 1982). The GSI score was used as indicator of overall distress at admission.

Substance-Use Screens. Urine drug screens (UDS) and alcohol breathalyzers were given at various points during the inpatient stay. UDS occurred when a patient was transferred from the admissions program to the dual-diagnosis program. In addition, UDS and breathalyzers were given both randomly and on “suspicion” (e.g., following an off-grounds pass). Breathalyzer screens were sensitive to the presence of alcohol in the body for the preceding 24-hour period. The drug screens, however, yielded a profile indicating presence in the body of a wide array of “street” drugs often abused by participants (e.g., THC, cocaine, heroin, etc.). Screens of either type could be given to any participant regardless of admitting diagnosis. The program kept records of all drug and alcohol screens. These records were reviewed for the occurrence of positive screens. A positive screen (i.e., a “dirty”) was coded as 1; negative results (“clean”) were coded as 0.

Community-Intake Appointments. Liaison staff members in the separate communities from which individuals were admitted supervise discharge aftercare programs. These programs include scheduling an intake appointment at the community mental-health agency for each individual. In order to evaluate compliance with this intake appointment, the community liaisons contacted the community mental-health agencies and recorded whether a person had attended the intake appointment. The intake appointment is considered important in the initial phase of post-discharge compliance. Persons would not receive services if they did not attend the intake interview. As stated earlier, many dually diagnosed patients have problems with compliance following discharge from an inpatient treatment program. This information was coded as a dichotomous variable (0 = the patient did not attend this interview, 1 = the patient attended the intake interview). One community mental-health agency did not provide the designated liaison with information about compliance with the appointment despite agreeing to participate in the research project (N = 15). Two other sites failed to provide information on a small number of participants (N’s = 3, 2). Data on these individuals then were unusable for analysis.

Statistical Analyses

We first examined descriptive data available from patient records to determine the different diagnoses determined by the treatment teams. We then used this information to examine any possible differences between personality-disorder groups and the three problem-solving variables and the separate criterion variables.

Correlations were computed between the three problem-solving variables, the three personality-disorder variables, the three personality-disorder variables, and the two self-report measures of adjustment at admission to the program. This permitted an examination of the relations between the social-problem-solving and personality-disorder characteristics in this sample.
Regression equations then were used to test the relation of the Problem Solving Confidence factor to adjustment, after controlling for personality-disorder characteristics. Separate equations (to predict depressive behavior and distress, respectively) were computed, entering the three personality variables as a block at the first step and the two problem-solving variables—Approach–avoidance and Personal Control—believed to be unrelated to adjustment in this sample. The PSC variable was entered at the final step of the equation. This procedure provides a rigorous test of the predicted relationship between PSC and distress, and it allows inspection of possible mediating effects of the personality variables on the PSC–distress relationship. This stepwise procedure has been used in previous tests of the theoretical properties of the social-problem-solving model (e.g., Elliott et al., 1995; Godshall & Elliott, 1997).

Separate logistic-regression equations were used to predict dirty substance-use screen results and compliance with the first community outpatient visit.

Results

Inspection of patient records revealed that the majority of participants \( (N = 92) \) were diagnosed by the treatment team as having a Personality Disorder Not Otherwise Specified (see Table 1). This diagnosis is to be given for disorders of personality functioning that are not classifiable as a specific personality disorder (American Psychiatric Association, 1987). It was not clear why so many of the participants received this diagnosis from the treatment team. Thus, the personality-disorder categories from the patient records were not useful in categorizing personality clusters for further analyses. Additionally, many of the patients had a concurrent Axis I diagnosis of Major Depressive disorder \( (N = 36) \) and Organic disorders secondary to substance abuse \( (N = 19) \). Almost half of the sample was diagnosed with Polysubstance Dependent disorder \( (N = 53) \); Alcohol Dependence \( (N = 41) \) and Cocaine Dependence \( (N = 16) \) were the other substance-abuse diagnoses. These results generally are consistent with previous studies of diagnostic categories among persons with dual-diagnoses disorders (e.g., Crowe, Rosse, Sheridan, & Deutsch, 1991).

Descriptive Differences by Personality-Disorder Cluster

Given the skewed distribution of personality-disorder diagnoses in the clinical records, we then used the MCMI data to classify participants into distinct personality clusters for further analyses. Following recommended procedures, we first deleted invalid Millon profiles from the sample to ensure valid data for subsequent analyses. This reduced the usable number of participants to 74 persons with completed-depression measures (66 persons had completed-BSI measures). This group was comprised of 60 men (average age = 34.52, \( SD = 7.66 \)) and 14 women (average age = 30, \( SD = 5.83 \)). Sixty-one percent of this group was Caucasian; the others were African American. Fifty percent of this group were diagnosed as polysubstance-abuse disorders and 40.5% had alcohol-abuse disorders. As observed in the overall sample, the majority of this group was unmarried at admission (89.2%). The average length of stay for this group was 45.25 days \( (SD = 25.39) \). Comparisons found no significant differences between men and women on the problem-solving and self-report-criterion variables; as a group, the men were significantly older in age \( (M = 34.52) \) than the women \( (M = 30) \).

We then used the MCMI to classify each participant into one of the three personality diagnostic clusters. Following a procedure used in previous research (Elliott, Jackson,
Layfield, & Kendall, 1996), we used the highest scale score on the MCMI to determine the most prominent personality disorder evident in the profile. The highest scale score also determined cluster membership for each participant. Using this method, five individuals were classified in Cluster A, 43 were classified in Cluster B, and 26 were classified in Cluster C. Comparisons found no significant differences (all $F$'s, 1.6) between the three cluster groups on the three problem-solving variables and the two self-report-criterion variables. No age differences were found between the cluster groups. The distribution of men and women across the three clusters was not significantly different from what would have been expected by chance, $\chi^2(2) = 1.46, ns$. The distribution of personality-disorder-cluster membership was not associated significantly with the occurrence of a dirty substance abuse screen [$\chi^2(2) = .37, ns$]; the association between personality-cluster and attendance at the community appointment approached statistical significance, $\chi^2(2) = 5.12, p = .07$. Thus, personality-disorder diagnostic cluster was not associated with self-appraised problem-solving abilities. Similarly, personality-disorder cluster was not related significantly to any of the criterion variables.

### Table 1

Frequencies for Demographic and Admitting Characteristics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>90</td>
</tr>
<tr>
<td>Women</td>
<td>27</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>19</td>
</tr>
<tr>
<td>Unmarried</td>
<td>97</td>
</tr>
<tr>
<td>Not Recorded</td>
<td>1</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>71</td>
</tr>
<tr>
<td>African American</td>
<td>45</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1</td>
</tr>
<tr>
<td><strong>Substance Abuse Diagnosis: Axis I</strong></td>
<td></td>
</tr>
<tr>
<td>Alcohol</td>
<td>41</td>
</tr>
<tr>
<td>Cocaine</td>
<td>16</td>
</tr>
<tr>
<td>Polysubstance</td>
<td>53</td>
</tr>
<tr>
<td>Not Otherwise Specified</td>
<td>2</td>
</tr>
<tr>
<td>Not Recorded</td>
<td>5</td>
</tr>
<tr>
<td><strong>Concurrent Diagnosis: Axis I</strong></td>
<td></td>
</tr>
<tr>
<td>Major Depression</td>
<td>36</td>
</tr>
<tr>
<td>None</td>
<td>21</td>
</tr>
<tr>
<td>Organic*</td>
<td>19</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
</tr>
<tr>
<td>Bipolar</td>
<td>9</td>
</tr>
<tr>
<td>Not Recorded</td>
<td>18</td>
</tr>
<tr>
<td><strong>Axis II Diagnosis</strong></td>
<td></td>
</tr>
<tr>
<td>Personality Disorder Not Otherwise Specified</td>
<td>92</td>
</tr>
<tr>
<td>Other Personality Disorder</td>
<td>7</td>
</tr>
<tr>
<td>Not Recorded</td>
<td>18</td>
</tr>
</tbody>
</table>

**Note.**  $N = 117$.

*Organic refers to a disorder or syndrome in which a psychological or behavioral abnormality is associated with a transient or permanent dysfunction of the brain, at times secondary to substance intoxication or withdrawal.
The associations between the problem-solving, self-reported adjustment, and the summed cluster scores then were examined. Pearson correlations revealed ineffective problem-solving scores on the PSI were significantly associated with greater Cluster A and Cluster C characteristics (see Table 2). There were no significant correlations between the problem-solving variables and Cluster B characteristics. Ineffective problem-solving skills (as measured by the AA factor) and a negative-problem orientation (assessed by the PC and PSC factors) were associated with more anxious, fearful traits (Cluster C) and with more odd, eccentric behaviors (associated with Cluster A). All problem-solving and personality variables were correlated significantly with the depression and distress variables.

Prediction of Depressive Behavior and Distress at Admission

The first regression equation tested the relation of a positive-problem orientation to depressive behavior (as measured by the BDI) after considering personality characteristics. The three personality variables accounted for a significant amount of variance in BDI at the first step of the equation, \( F(3,70) = 15.26, R^2 = .40, p < .0001 \). Post-hoc tests indicated that higher Cluster A scores were associated significantly with higher BDI scores, \( \beta = .52, t = 3.91, p < .001 \). AA and PC scores, entered as a block at the second step of the equation, did not augment significantly the prediction of BDI scores, \( F_{inc}(2, 68) = .22, ns \). PSC scores, entered at the final step, were predictive significantly of depressive behaviors at admission, \( F_{inc}(1, 67) = 4.82, R_{inc}^2 = .04, p < .05 \). Greater confidence in problem-solving abilities, then, remained uniquely predictive of less depressive behavior after controlling for personality-disorder characteristics.

In the second regression equation, the block of cluster scores was predictive significantly of distress at admission, \( F(3,62) = 15.06, R^2 = .42, p < .0001 \). Higher cluster A scores, indicative of odd and eccentric behavior, were associated with higher GSI scores, \( \beta = .43, t = 3.14, p < .01 \). The AA and PC scores, entered at the second step, did not contribute significantly to the equation, \( F_{inc}(2, 60) = .37, ns \). PSC scores, entered at the final step, were predictive significantly of distress, \( F_{inc}(1, 59) = 4.02, R_{inc}^2 = .04, p < .05 \). Consistent with our predictions, greater confidence in problem-solving abilities was
associated with less distress, and this relationship was not obviated by the personality-disorder characteristics.

**Prediction of Dirty Screens during Treatment**

During the course of the program, 56 persons had clean substance-use screens, 12 had at least one positive result, three had two positive results, and two had three “dirties” \( (M = .33, SD = .69) \). A total of 65 persons had clean breathalyzer results, 8 had one positive result, and one person had three positive results \( (M = .15, SD = .46) \). Fifty-three persons had clean test results during the course of treatment: 17 persons had dirty results. A significant association was found between substance-abuse diagnosis (coded as 0 = drug abuse, 1 = alcoholism, four persons had no substance-abuse diagnosis recorded) and the occurrence of dirty test results, \( \chi^2(1) = 5.83, p < .05 \). This distribution indicated that a disproportionate number of persons with a dirty test result was diagnosed with drug-abuse problems other than alcoholism \( (N = 14) \). Thus, substance-abuse diagnosis was included in the logistic-regression equation to predict participants with clean and dirty test results during the course of the treatment program.

The abuse variable, the three personality variables, and the three problem-solving variables were included as predictor variables. A series of univariate \( t \)-tests conducted on each self-report variable between the two groups revealed a significant difference on the PSC variable (see Table 3). Persons with clean results had greater confidence in problem-solving abilities than persons with dirty results.

A forward-entry logistic equation with 95% confidence intervals for estimated odds ratio and a classification cutoff of 25% (to reflect the actual number of those with dirty results) was computed. This equation selected the abuse variable as the single best predictor of test results, \( b = -1.71, p < .001 \) (see Table 4). A diagnosis of drug abuse other than alcoholism was associated with the occurrence of a dirty test result. PSC was selected

<table>
<thead>
<tr>
<th>Variable</th>
<th>Clean Results</th>
<th>Dirty Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( N = 53 )</td>
<td>( N = 17 )</td>
</tr>
<tr>
<td>A Score</td>
<td>70.37 (16.87)</td>
<td>76.29 (11.96)</td>
</tr>
<tr>
<td>B Score</td>
<td>80.02 (19.07)</td>
<td>85.02 (14.24)</td>
</tr>
<tr>
<td>C Score</td>
<td>74.85 (17.58)</td>
<td>79.21 (13.21)</td>
</tr>
<tr>
<td>PSC</td>
<td>27.36 (11.74)</td>
<td>34.41* (12.08)</td>
</tr>
<tr>
<td>PC</td>
<td>18.40 (5.22)</td>
<td>20.24 (5.63)</td>
</tr>
<tr>
<td>AA</td>
<td>49.53 (15.08)</td>
<td>52.12 (15.23)</td>
</tr>
</tbody>
</table>

*Note. * Standard deviation in parentheses.

*\( p < .05 \).
at the second step of the equation, $b = .05, p < .05$. Effective PSC scores were associated with the occurrence of a clean test result. The odds-ratio of Problem Solving Confidence to the prediction of test results was 1.055. Thus, in the context of this equation, a one-point increase on the PSC scale increased the likelihood of a dirty test result by 5.5%. The final model correctly classified 70% of participant test results, $\chi^2(2) = 11.05, p < .01$ (see Table 5).

**Prediction of Attendance at the First Community Outpatient Visit**

Thirty-three persons did not attend their scheduled community outpatient appointment; 20 participants kept this appointment as recommended. This sample included 46 men and 7 women. Comparisons between the 53 participants who had recorded data concerning the community outpatient visit and those who had no available data ($N = 21$) revealed several differences between the two groups on the self-report measures. The group with no available data had significant higher Cluster C scores (82.15) than those with recorded data concerning the outpatient visit (72.83). Additionally, the group that had no available data had more negative appraisals of their problem-solving ability on each of the PSI scales (PSC, 26.79; PC, 18.06; AA, 47.96; all $F$’s $> 4.90, p$’s $< .05$). These groups did not differ significantly in age or in the depression and GSI scores at admission. There was no uneven distribution between the two groups in terms of race, marital status, or substance-abuse diagnosis. There was a greater number of men in the group with recorded data than that expected by chance (46 with data, 14 without; $\chi^2(1) = 3.97, p < .05$).

Comparisons also were made between those who attended the community outpatient visit and those who did not. No significant association was found between substance-abuse diagnosis and attendance, $\chi^2(1) = .02, ns$. Therefore, this variable was not used in

### Table 4
*Predictive Model for Substance-Abuse Screens*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Odds Ratio</th>
<th>95% Confidence Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABUSE</td>
<td>-1.71</td>
<td>.181</td>
<td>.04-.75</td>
</tr>
<tr>
<td>PSC</td>
<td>.05</td>
<td>1.055</td>
<td>1.00-1.11</td>
</tr>
</tbody>
</table>

**Table 5**
*Classification Matrix of Participants with Clean and Dirty Substance-Abuse Screens*

<table>
<thead>
<tr>
<th>Actual Group</th>
<th>Predicted Group</th>
<th>Clean</th>
<th>Dirty</th>
<th>% Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean</td>
<td></td>
<td>36</td>
<td>17</td>
<td>67.92</td>
</tr>
<tr>
<td>Dirty</td>
<td></td>
<td>4</td>
<td>13</td>
<td>76.47</td>
</tr>
</tbody>
</table>

*Note.* Total percent accuracy = 70.0%.
the subsequent logistic model to predict attendance. Separate t-tests revealed several differences between the two groups on the self-report variables (see Table 6). Specifically, individuals who did not keep their appointment had significantly lower PSC and PC scores. Persons who did not keep their appointment had greater confidence in their problem-solving abilities and reported greater control over their emotions than those who did attend the appointment. Similarly, persons who attended the appointment had higher Cluster C scores.

A forward-entry logistic equation with 95% confidence intervals for estimated odds ratio and a classification cutoff of 38% was calculated. This equation selected the PSC variable as the only significant predictor of attendance, \( b = .056, p < .05 \). The odds-ratio of Problem Solving Confidence was 1.06 (95% CI = 1.00–1.12). A one-point increase in PSC scores increased the odds of compliance with the appointment by 6%. As depicted in Table 7, the final model correctly classified 64.15% of participants, \( \chi^2(1) = 4.47, p < .05 \). The model particularly was effective in predicting those who did not keep their appointment.

### Table 6

Mean Scores and Standard Deviations on Self-Report Variables of Participants Who Kept the Community Appointment and Those Who Did Not

<table>
<thead>
<tr>
<th>Variable</th>
<th>No Show (N = 33)</th>
<th>Kept Appointment (N = 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Score</td>
<td>68.77 (16.92)</td>
<td>75.92 (15.99)</td>
</tr>
<tr>
<td>B Score</td>
<td>80.64 (22.20)</td>
<td>79.89 (14.24)</td>
</tr>
<tr>
<td>C Score</td>
<td>69.21 (19.26)</td>
<td>78.79* (12.94)</td>
</tr>
<tr>
<td>PSC</td>
<td>24.30 (9.04)</td>
<td>30.90** (13.12)</td>
</tr>
<tr>
<td>PC</td>
<td>16.91 (5.32)</td>
<td>19.95** (4.56)</td>
</tr>
<tr>
<td>AA</td>
<td>46.21 (14.82)</td>
<td>50.85 (15.13)</td>
</tr>
</tbody>
</table>

*Note. Standard deviation in parentheses.
*\( p < .06 \); **\( p < .05 \).

### Table 7

Classification Matrix of Participants Who Kept the Community Appointment and Those Who Did Not

<table>
<thead>
<tr>
<th>Predicted Group</th>
<th>Actual Group</th>
<th>No Show</th>
<th>Kept Appointment</th>
<th>% Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Show</td>
<td>24</td>
<td>9</td>
<td>72.73</td>
<td></td>
</tr>
<tr>
<td>Kept Appointment</td>
<td>10</td>
<td>10</td>
<td>50.00</td>
<td></td>
</tr>
</tbody>
</table>

*Note. Total percent accuracy = 64.15%; N = 53.
appointment (72.73%). Contrary to our predictions, a greater positive orientation—as assessed by the PSC scale—was associated with noncompliance.

Post-Hoc Analyses

In light of the paradoxical relations found between the two measures of the problem orientation and compliance with the first community outpatient appointment, we returned to the original data set for additional analyses. We retrieved 24 additional protocols that had been deleted from analysis due to invalid MCMI profiles. These individuals had completed the Problem Solving Inventory and records were available concerning their compliance with the outpatient appointment. Using this larger sample, we found that persons who attended the appointment had significantly higher Personal Control ($N = 33; M = 20.85, SD = 4.74$) and Problem Solving Confidence ($M = 31.79, SD = 12.45$) scores than persons who did not comply with this appointment ($N = 44; M's = 17.91, 26.77; SD's = 5.10, 10.04$, respectively). No difference was found between the groups on the Approach-Avoidance scores. Thus, as we found in the first analyses, persons who did not comply with the community appointment reported a more positive problem orientation during their inpatient stay. We then conducted a forward-entry logistic-regression equation using the three problem-solving variables to predict appointment status (no-show, kept appointment). The 95% confidence intervals for estimated odds ratio again was utilized. The PC variable was selected as the best single predictor of attendance, $b = .12, p < .02$. The odds-ratio of Personal Control was 1.13 (95% CI = 1.02–1.25). Therefore, with this larger sample, a one-point increase in PC scores increased the odds of keeping the appointment by 13%. The resulting model correctly classified 62.34% of participants, $\chi^2(1) = 6.59, p < .02$ (see Table 8). Similar to the previous analysis, effective skills in regulating emotions in problem-solving situations—another positive aspect of the problem-orientation component—were associated with noncompliance with the community appointment.

Discussion

Our findings yield partial support for our hypotheses and raise intriguing concerns about possible shortcomings in our application of social-problem-solving models in this population. Consistent with our predictions, the Problem Solving Confidence (PSC) factor retained a significant and unique relationship with two measures of emotional adjustment

<table>
<thead>
<tr>
<th>Predicted Group</th>
<th>Actual Group</th>
<th>No Show</th>
<th>Kept Appointment</th>
<th>% Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Show</td>
<td>31</td>
<td>13</td>
<td></td>
<td>70.45</td>
</tr>
<tr>
<td>Kept Appointment</td>
<td>16</td>
<td>17</td>
<td></td>
<td>51.52</td>
</tr>
</tbody>
</table>

Note. Total percent accuracy = 62.34%; $N = 77$. 

Table 8

Classification Matrix of Participants in the Large Sample Who Kept the Community Appointment and Those Who Did Not
at admission after controlling for the variance in these variables attributable to personality-disorder tendencies. It is not surprising that the personality-disorder cluster scores would account for a relatively high degree of variance in the BDI and GSI variables. Many characteristics associated with Cluster C tendencies, for example, include a disposition for negative affects, dysfunctional cognitions, and an intractable pessimism and irrational beliefs that perpetuate anxiety, depression, and distress (Millon & Klerman, 1986). The MCMI questionnaires occasionally have been criticized for being too sensitive to respondent distress and emotional maladjustment (Overholser, Kabakoff, & Norman, 1989). It is impressive, then, that the PSC factor remained predictive of the distress variables after considering personality-disorder characteristics. It appears that the problem orientation retains its theorized relationship with distress among persons with dual diagnoses, despite any personality-disorder–distress relationship.

Moreover, an element of self-appraised social-problem-solving abilities was the only self-report variable to contribute to the prediction of adherence to the treatment program. Persons who had clean substance-use screens were more likely to have problems with alcohol abuse and were likely to have greater confidence in their problem-solving abilities. A person with a positive-problem orientation—as assessed by the PSC factor—presumably possesses more motivation and more goal-directed tendencies than a person with a more negative orientation (D’Zurilla & Nezu, 1990; Nezu & D’Zurilla, 1989). This finding is consistent with our understanding of the social-problem-solving model and related research. In the context of the inpatient program, it seems that a greater confidence in problem-solving abilities was associated with a greater willingness to adhere to program expectations for therapeutic behavior.

Nevertheless, the motivational and goal-oriented properties of the problem-orientation component on occasion may conflict with clinically meaningful and therapeutic regimens. Individuals with a positive orientation were less likely to attend the community intake appointment. This finding was contrary to our predictions; our predictions, in turn, were based on (a) our interpretation of the social problem solving, (b) our understanding of adaptive behavior and indices of adjustment in the substance-abuse treatment program and as indicated in the extant literature, and (c) our speculation that effective problem solvers would share the logic posed by the treatment program and adhere to the recommendations of the program staff to attend the community intake appointment.

Individuals with a positive-problem orientation are motivated to solve their problems with goal-directed activities; they are motivated to engage in complex problem-solving tasks necessary to resolve difficult and intricate problems (D’Zurilla & Nezu, 1990; Nezu & D’Zurilla, 1989). Evidence also indicates that a positive orientation is predictive of accurate cognitive problem-solving performance regardless of negative mood reactions (Shewchuk, Johnson, & Elliott, 2000). Thus, it would seem that persons with a positive orientation in this study did not have a shared view of the “problem” identified by the treatment program, and they were not motivated to keep the scheduled appointment despite the recommendations of the program. Perhaps these persons were more concerned with more immediate problems in their home environments. It also is possible that these persons had a level of confidence and sense of control over their emotions to the extent that they were “over-confident” about their ability to maintain sobriety on their own (for a related discussion, see Larson & Heppner, 1989). Finally, it may be that these persons had identified another personal problem more subjectively urgent and pressing that interfered with the appointment: these persons already may have relapsed and resumed their substance abuse following discharge into the community. We are limited in that we do not know why these persons did not keep their appointment; we do not know if failure to attend was related to a higher rate of relapse than those who kept their appointment.
Alternatively, it should be noted that persons who reported fewer abilities in regulating their emotions and a lack of confidence in their problem-solving abilities were more likely to attend the community appointment. Perhaps these individuals perceived a greater need for continued assistance and involvement in the aftercare program.

Theoretically, these findings suggest that our applications of the social-problem-solving model must take into consideration the unique and phenomenologically defined problems identified by participants and respondents. We do not know if persons with a positive orientation in our study valued the necessity of the community appointment or if they were having difficulties with relapse. However, we do know that they were not motivated sufficiently to attend this appointment at the rate observed among persons with a more negative orientation despite evidence that a positive orientation was associated with less distress and greater adherence during the program.

The present study indicates that self-appraised social-problem-solving abilities may be important indicators of treatment progression and outcome, although further work is needed to ascertain mechanisms and reasons for some of these associations. In contrast, personality-disorder characteristics were not related significantly to either outcome measure. While personality characteristics are viable clinical considerations for assessment, the present study indicates that these tendencies may have limited predictive utility for designing interventions and projecting outcomes among persons in substance-abuse treatment. These data indicate that cognitive-behavioral characteristics are related to indices of adjustment and rehabilitation among persons with dual diagnoses, regardless of any concomitant personality disorder. It is insufficient, then, to restrict assessment and intervention practices to these personality features. Future work that focuses on the subjective problems perceived and experienced by persons with dual diagnoses may be required for effective social-problem-solving interventions to be developed for the specific and unique needs of these individuals.

References


