AM. J. DRUG ALCOHOL ABUSE, 24(4), pp. 551–571 (1998)

The Motivation for Drug Abuse Treatment: Testing Cognitive and 12-Step Theories

David C. Bell, Ph.D.*
Isaac D. Montoya, Ph.D., CMC
Alan J. Richard, Ph.D.
Cheryl A. Dayton, B.A.
Affiliated Systems Corporation
Houston, Texas

ABSTRACT

The purpose of this paper is to evaluate two models of behavior change: cognitive theory and 12-step theory. Research subjects were drawn from three separate, but parallel, samples of adults. The first sample consisted of out-of-treatment chronic drug users, the second consisted of drug users who had applied for treatment at a publicly funded multiple-provider drug treatment facility, and the third consisted of drug users who had applied for treatment at an intensive outpatient program for crack cocaine users. Cognitive theory was supported. Study participants applying for drug abuse treatment reported a higher level of perceived problem severity and a higher level of cognitive functioning than out-of-treatment drug users. Two hypotheses drawn from 12-step theory were not supported. Treatment applicants had more positive emotional functioning than out-of-treatment drug users, and one treatment-seeking sample had higher self-esteem.

Key Words. Cognitive functioning; Drug abuse; Emotional well-being; Hitting bottom; Psychological functioning; Treatment; 12-step theory

* To whom correspondence should be addressed at Affiliated Systems Corporation, 3104 Edloe, Suit 330, Houston, TX 77027-6022. Telephone: (713) 439-0210. Fax: (713) 439-1924. E-mail: ASC-@Phoenix.Net

INTRODUCTION

Drug abuse treatment is generally regarded as a voluntary process of counselor- or therapist-assisted self-change. In this way, drug abuse treatment resembles other therapist-assisted self-change processes. The voluntary aspect of self-change means that, while the counselor can facilitate change, it is the client who has decided to change and the client who must decide whether to continue or abandon the change process. To the extent that it is voluntary, self-change is said to depend on the client's motivation for change. A therapist, the old joke maintains, cannot change a light bulb ''unless the light bulb really wants to change.'' As the term's etymology implies, motivation is the ''moving'' force in the client—that is, the force moving the client to treatment and the force moving the client through treatment (1, 2).

Although it is often invoked, the concept of motivation for change is not yet well understood (2–4). In fact, some researchers have expressed concern that it may function primarily to shift responsibility for treatment failures from the therapist to the client (2–4). Behavior change theorists have only recently begun to address the problem of motivation in a systematic way. As a result of their work, much progress has been made in our understanding of the cognitive component in motivation. Social learning theory (5, 6), rational choice theory (7), the health belief model (8, 9), the theory of reasoned action (10–12), the theory of planned behavior (13), the transtheoretical stage model (14), and the assertiveness model (15) all offer relatively developed cognitive accounts of motivation.

Cognitive theories of behavior change conceptualize behavior change as a series of rational choices. An individual's perception of the probable personal consequences of behavior is an important element of behavior change in these models (16–18). For instance, *perceived severity* and *perceived susceptibility* are the primary determinants of behavior change in the Health Belief Model. *Perceived severity* refers to the degree of physical pain, disfigurement, or social impairment ascribed to a specified disease state, and *perceived susceptibility* refers to an individual's beliefs that the individual's risk behavior is likely to result in that disease state (9). Research using the Health Belief Model has indicated that substantial variation in some behaviors persists after accounting for both perceived severity and perceived susceptibility.

More recent theories conceptualize perceived outcomes or consequences of behavior as weighted by their subjective importance to an actor, independent of that actor's perception of their severity or of the actor's susceptibility. For instance, Reasoned Action theory offers a construct, called *outcome evaluation*, to refer to subjective weights assigned by a respondent to specified physical and social outcomes (12).

This additional component of subjective weights may be especially salient for explaining the initiation and cessation of chronic drug use. Chronic drug users are believed to view the prospect of anticipated physical or social impairment resulting from drug use differently from nondrug users, even when both possess the same amount of information regarding the consequences of drug use. Insights into how individuals assign weights to outcomes could be of immense importance in understanding what motivates drug users to initiate the self-change process that leads them to treatment.

Descriptions of the implicit theory utilized in 12-step programs such as Alcoholics Anonymous and Cocaine Anonymous are more attentive to the emotional components of behavior change than are most cognitive models (19–23). Elements of this theory are popular among many former substance abusers and among substance abuse paraprofessionals, such as substance abuse counselors. They are less popular among academically trained social scientists. Descriptions of 12-step theory tend to be somewhat mystical and imprecise, a fact that often alienates academically trained researchers. Consequently, according to Bristow-Braitman: ''substance abuse, as a field of inquiry and treatment, is probably unrivaled with respect to the disdain held by those providing treatment toward those researching treatment and vice versa'' (24, p. 415).

Unlike most rational choice models, 12-step theory defines *hitting bottom* as an emotional and cognitive experience that motivates an actor to reevaluate behavioral options (25). Metaphorically, the phrase invokes the sudden termination of a fall. In a condensed form, the image of hitting bottom contains an implicit criticism of rational choice theory's aloofness with regard to emotion. If motivation for change is initiated by first hitting bottom, then cognitive accounts cannot tell the whole story any more than these accounts could tell the whole story about falling down two stories and landing on the pavement. An individual who survives a fall, like an individual who survives hitting bottom, may be prompted by this experience to reflect on the events that led to that experience. However, the effects of the experience itself are not reducible to the effects of reflection on the experience.

Hitting bottom shares characteristics with the cognitive-theoretical constructs of perceived severity and outcome evaluation, while maintaining distinct differences. Formally, hitting bottom is similar to perceived severity and outcome evaluation in that it mediates between probable outcomes of an individual's behavior and the extent to which an individual will act on his or her knowledge of these outcomes. Hitting bottom differs from these constructs, however, because hitting bottom is not so much a matter of recognizing or anticipating ''severe'' problems as it is a matter of feeling bad. Hitting bottom does not preclude the role of perceived severity, but it is not reducible to it. Whereas perceived severity names the degree to which an individual intellectually appreciates the probable conse-

quences of his or her actions, hitting bottom names the degree of emotional distress that the prospect of these consequences elicits from an individual (25). Thus, Gorski notes that ''understanding alone is not enough. . . . The first step isn't complete until the head and the heart match'' (26, p. 53). The structure of feeling is rearranged, and this rearrangement parallels the rearrangement of cognitive structure associated with behavior change in cognitive models. Thus, the distinctive components of hitting bottom are not cognitive components, but components that involve emotion. Depression, anxiety, and self-esteem are three key emotional constructs related to hitting bottom. A recent 12-step ''recovery workbook'' describes the experience of hitting bottom as both ''saddening'' and self-''deflating'' (27, p. 12).

According to 12-step theory, behavior change cannot occur until someone or something transforms the emotional component of a drug user's attitude, as well as the cognitive component (22). It is when drug users ''hit bottom'' that the severe consequences of their addiction can be perceived as consequences that matter to them, and it is not until these perceived consequences matter to them that they can take the first step toward recovery (26). According to the theory, hitting bottom causes the drug user to feel powerless, as if their life were out of control. Thus, hitting bottom feels very painful to the drug user (20, 27). A negative self-image and low self-esteem are said to accompany this event (25). Nevertheless, 12-step theory conceptualizes hitting bottom as a beneficial pain, a necessary component of positive change. Effective intervention can only begin when the user voluntarily acknowledges that the user's life is out of control (28). Thus the ''first step'' in the 12 steps of recovery is the admission that ''we were powerless over alcohol—that our lives had become unmanageable'' (19, p. 59). As such, hitting bottom is not unlike Dabrowski's notion of ''positive disintegration'' (29) or Kristeva's conceptualization of the subject ''in process/on trial'' (30).

Figure 1 illustrates the hitting bottom concept. In the figure, the person experiences a normal level of functioning prior to involvement in chronic drug use. Functioning declines with continued drug use until the person reaches an individually determined, unbearably low level of functioning. At this personal ''bottom,'' the person commits to change. Recovery is not guaranteed and may involve slow improvement with many lapses over a long period of time.

Some empirical evidence has been found in support of the description of hitting bottom given in the 12-step literature reviewed above. Drug users in recovery have frequently reported such an experience as central to the behavior change process. In a follow-up study of 42 recovered alcoholics who had undergone psychiatric treatment for alcoholism, Nordström and Berglund found that 38% named hitting bottom as a reason for their recovery (31). Of course, follow-up studies such as this may be contaminated by ideological aspects of the treatment

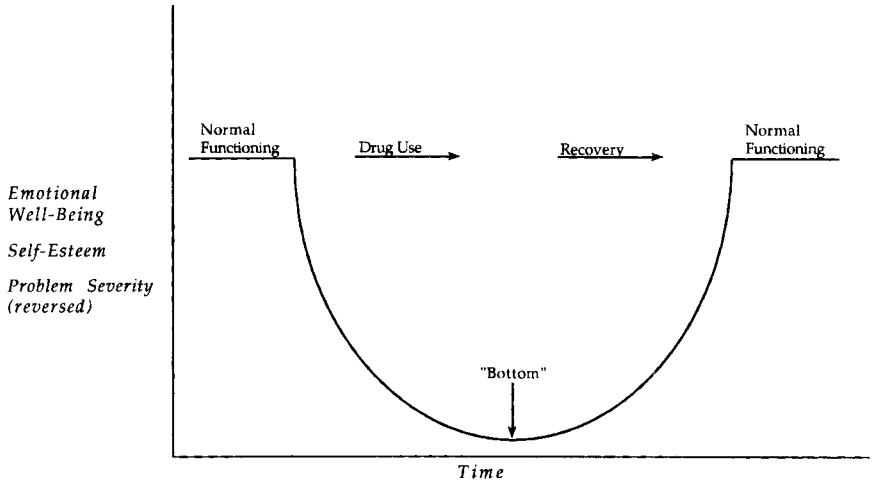

Fig. 1. Hitting bottom concept.

experience. However, similar experiences have been reported among drug users who recover without treatment (32) and even among former drug users who express a disdain for many aspects of 12-step programs (33).

In a more direct test of the components of hitting bottom that 12-step theorists have identified, Rounsaville and Kleber compared community drug users (mostly opiate and marijuana users) to drug users in treatment (34). They found that the group of drug users who sought treatment had more legal and substance abuse problems, more social, family, and parental problems, and more severe depression than the community drug users. Montoya and colleagues compared drug users applying for treatment-centered studies to drug users applying for nontreatment studies and found significantly higher psychological distress, as measured by the Hopkins Symptom Check List (SCL-90-R), among the applicants for treatment studies (35). Gawin and Kleber (36), Rounsaville and colleagues (37), and Weiss and colleagues (38, 39) have reported higher rates of psychological distress among treatment-seeking than among untreated cocaine abusers.

Reports of emotional distress as a motivating force in behavior change, consistent with the 12-step concept of hitting bottom, have not been limited to changes in drug use behaviors. Prochaska and coworkers (40, 41) and Prochaska and DiClemente (42) found that emotionally distressing events and confrontations, similar to those 12-step theory associates with hitting bottom, were recalled as influences in movement from precontemplation to contemplation stages by suc-

cessful self-changers of various problem behaviors, including weight loss and smoking cessation. Successful self-changers also identified self-reevaluation as the primary influence in initiating the self-change process. Self-reevaluation is said to involve a ''corrective emotional experience'' that changes ''how one feels and thinks about oneself with respect to a problem'' (41, p. 1109).

In contrast to evidence that supports the hitting bottom process, other research suggests that individuals are more likely to implement successful behavior changes when their emotional states are positive (6, 43) and when self-efficacy is high (6, 13). In the specific context of drug treatment, McLellan and colleagues found that clients with low psychiatric severity improved most in alcohol and drug treatment (44). In a study of unaided recovery of persons with serious drinking problems, Perri failed to detect any aspects of psychological well-being that reliably predicted success in abstaining from drinking (45).

Like these earlier studies, the study reported here addresses the problem of motivation. Specifically, it addresses the motivation to seek treatment for drug addiction. In terms of the components of motivation, it examines the role of problem severity, emotional well-being, cognitive functioning, and self-esteem in the decision to seek treatment. For purposes of this study, we define ''hitting bottom'' as a relatively low level of emotional well-being and self-esteem that precedes efforts at behavior change. This level differs for each person. Thus, whether or not an individual has hit bottom depends to some extent on their own assessment of the severity of their problems. As described in 12-step theory, these low levels of emotional well-being and self-esteem are accompanied by a relatively high level of cognitive functioning (26). This expectation is also consistent with cognitive theory. Operationally, we measure the predictions of cognitive theory by cognitive functioning and problem severity. We measure hitting bottom by scales that measure emotional well-being and self-esteem. The specific hypotheses to be tested are

1. Drug users who enroll in a treatment program will report higher perceived problem severity than users who are not in treatment (cognitive theory and 12-step theory).
2. Drug users who enroll in a treatment program will report higher levels of cognitive resources than users who are not in treatment (cognitive theory and 12-step theory).
3. Drug users who enroll in a treatment program will report lower levels of emotional well-being than users who are not in treatment (12-step theory).
4. Drug users who enroll in a treatment program will report lower levels of self-esteem than users who are not in treatment (12-step theory).

METHODS

Study Samples

Data for this study were drawn from three separate, but parallel, samples of adults. The first was a targeted sample of out-of-treatment chronic drug users participating in a larger, multisite study on drug abuse, human immunodeficiency virus (HIV) risk behaviors, and risk-reduction outcomes supported by the National Institute on Drug Abuse (NIDA). Candidates for this study were located and recruited in targeted community locations in Houston, Texas. Geographic areas of the city were selected and targeted for recruitment as the result of an assessment of rates of drug-related crimes, arrests for prostitution, and calls to emergency medical services for drug overdoses. Trained outreach workers went into the target areas to recruit participants by frequenting copping areas identified by ethnographic mapping and developing personal contacts with drug injectors and crack smokers.

Prior to participation, individual candidates were screened on several drug use and demographic variables. To be eligible for participation, candidates were required to have injected an illicit substance or smoked crack cocaine at least once and not to have been in drug treatment during the 30 days prior to participation. All candidates were asked to provide a urine sample, which was screened by a clinical laboratory for cocaine and opioid metabolites. Candidates claiming drug injection were required to show recent needle track marking. Those who claimed to have smoked crack cocaine must have had positive urine drug screens for cocaine to be included in the study. In addition, candidates were asked to provide sufficient information to allow study personnel to relocate them 6 months after intake. Study participants were also required to be 18 years of age or older, to reside within the boundaries of the targeted areas, and to sign an informed consent. Those who could not provide a verifiable address and telephone number were not included.

Interviews were conducted in private settings by trained interviewers, usually at community centers located in the neighborhoods from which study participants were recruited. Of the participants, 62% reported that they had never undergone drug abuse treatment. Participants were remunerated $10 for their time. The data were collected between March 17, 1992, and September 2, 1993.

The second sample for this study consisted of drug users who applied for treatment at a multiple-provider drug treatment facility, the Houston Recovery Campus (HRC), supported by the Center for Substance Abuse Treatment (CSAT) and the Texas Commission on Alcohol and Drug Abuse (TCADA). Clients in

three adult programs at the HRC were included in this sample. The adult programs were a 28-day intensive outpatient program for men and women (about 25 treatment hours per week), a 28-day residential program for men and women, and a 3-month residential program for women. Admission to all programs was coordinated by a centralized campus intake department. Requirements for admission to the HRC were residence in Harris County, financial indigence, a drug problem, and psychological appropriateness. Applicants with a dual diagnosis were referred elsewhere for treatment of their psychological problem. About 10% of participants were referred to the HRC by the criminal justice system. All participants signed informed consent for the study. Data on the participants in this sample were collected at intake between August 10, 1992, and March 9, 1993.

The third sample consisted of clients accepted into a drug treatment program supported by TCADA for crack cocaine users. This program was administered by a community hospital located in a high-drug-use, predominantly African-American neighborhood in Houston. Its intensive outpatient program used a cognitive behavioral approach composed of neurobehavioral group and individual counseling therapies, either alone or in combination with adjunct therapies (46). Clients were scheduled for treatment 3 to 4 days a week (about 20 sessions per week) for an intensive 3 months of treatment, followed by reduced treatment intensity. Transportation to and from the program was provided by the program. To be eligible for this treatment program, a participant was required to be a current crack cocaine abuser, at least 18 years of age, and a resident of Harris County (which includes the city of Houston). To participate in the study sample, clients were additionally required to speak and read English and to give informed consent for the study. About 30% of participants were involved with the criminal justice system at the time of intake. Data for this study were collected during intake interviews from April 1, 1992, to August 31, 1993.

Although the three samples included in this study were collected separately, they are in many ways comparable. The community sample was targeted to include the most serious crack cocaine and injection drug users in Houston by focusing on the geographical areas that showed evidence of the highest drug use problems. This was a largely indigent sample of drug users. The HRC is a treatment facility for the indigent of Houston and the surrounding county. The HRC thus drew heavily from the same high-drug neighborhoods from which the community sample was recruited. The intensive outpatient program targeted crack cocaine use in the African-American community; its participants were somewhat more economically successful than in the other two samples.

The three samples are compared in Table 1. The samples consist mostly of men, African-Americans between the ages of 26 and 40, individuals with less than a high school education, unemployed persons, and crack and powdered co-

Table 1. Characteristics of Samples

Variable	Community sample (n = 677) (%)	Treatment campus sample (n = 601) (%)	Intensive outpatient sample (n = 227) (%)	χ^2	p
Gender					
Male	67.4	69.5	61.7	4.59	.101
Female	32.6	30.5	38.3		
Race/ethnicity					
Anglo	12.2	20.4	4.9	123.38	.000
African-American	67.7	75.0	91.2		
Hispanic	20.1	4.6	4.0		
Age					
19–25	7.7	13.1	18.9	75.77	.000
26–30	17.1	24.6	28.6		
31–35	26.1	30.4	25.1		
36–40	22.9	16.3	17.2		
41 and up	26.1	15.5	10.1		
Education					
Less than high school	46.0	48.9	42.7	9.56	.049
High school graduate	34.3	26.7	32.6		
Post–high school education	19.7	24.4	24.7		
Employment					
Unemployed	57.1	96.0	76.7	231.39	.000
Part time	37.1	2.0	9.7		
Full time	5.9	2.0	13.7		
Primary problem drug					
Cocaine/crack	71.0	73.4	96.5	63.18	.000
Other	29.0	26.6	3.5		

caine users. There were some significant differences among the samples. Those in the community sample were somewhat older than in the in-treatment samples, and the community sample included more persons with part-time employment and contained a higher proportion of Hispanics. The intensive outpatient program contained a higher proportion of crack cocaine users and persons employed full time. Because of these differences, demographic variables were entered as control variables in subsequent analyses.

Measures

Information was gathered on the respondent's sociodemographic characteristics, including gender, race, ethnicity, age, education, employment status, and

primary problem drug (see Table 1). Emotional and cognitive resources were conceptualized in three domains (emotional well-being, cognitive functioning, and self-esteem). These domains were measured by a set of scales developed by Dwayne Simpson at Texas Christian University (47). Alpha reliabilities and validities are reported by Knight, Holcom, and Simpson (48).

Cognitive functioning describes a person's ability to make a rational evaluation of alternatives. It focuses on how well people think. The higher the level of cognitive functioning is, the more actors are capable of making rational choices among alternatives based on personal experience of outcomes or vicarious experiences from observation (5, 49, 50). The cognitive functioning domain was composed of scales that measured decision making, risk taking, and social conformity. Reliabilities on these scales range from .63 to .81.

Emotional well-being focuses on how people feel. The higher the level of emotional well-being is, the greater will be the actor's sense of happiness, health, inner strength, and peace (51–54). The emotional well-being domain was composed of scales that measured anxiety, depression, and hostility, each of which was treated as a negative measure of emotional well-being. Reliabilities range from .77 to .83.

Self-esteem is a domain that combines the cognitive and emotional. *Self-esteem* is an internal assessment of a person's worth (55, 56). As such, it combines the person's emotional feelings about the self, as well as an evaluation of the person's value or success. Self-efficacy is a component of self-esteem (5). Both self-esteem and self-efficacy are based on one's evaluation of past achievement or success. Self-efficacy uses this evaluation to calculate the probability of future success in some action. Self-esteem uses the evaluation of past achievement to construct a sense of self-worth (in some conceptualizations of self-esteem, the person does not use a personal evaluation of past success but instead uses others' evaluations; e.g., Ref. 57). The self-esteem domain was measured by a single self-esteem scale (reliability = .77).

Previous analyses that used these scales have suggested that relatively small changes on the psychological scales may have a clinical impact (58–60). Differences of about .15 to .40 on these scales represent small-to-medium effect sizes of .23 to .67 (61). Differences in this range were found to be significantly associated with the amount of treatment received and with changes in drug use (59). Clients who received greater amounts of treatment showed significantly greater changes on these psychological scales. Furthermore, greater changes on these scales were associated with greater reductions in drug use.

In addition to these domains of emotional and cognitive resources, another domain is considered in this study. Assessed problem severity is not an emotional

or cognitive resource, but it may serve as a trigger for the activation of emotional and cognitive resources (1). Therefore, it is included in analyses because it may shed light on 12-step and cognitive theories. The term *assessed problem severity* is used here in preference to ''motivation'' because it is a more-focused concept. Emotional well-being, cognitive functioning, and self-esteem can also be motivations for seeking drug abuse treatment. The assessed problem severity domain was composed of scales that measured the severity of problems caused by drug use and the desire for help. Reliabilities range from .72 to .90. A single, somewhat weak, measure of objective problem severity was collected for all three samples. This was the number of times the participant reported being arrested during his or her lifetime.

Each scale in the four domains consisted of 6 to 11 items on a 5-point scale from 0 (''never'') to 4 (''almost always''). Scores for negative items were reflected by subtraction from the scale maximum. Each scale was computed as a mean of its component items. Each domain was computed as a composite of component scale means. Negative scales were reflected in the computation of each domain. For example, anxiety, depression, and hostility were negative measures of emotional well-being, so their scale scores were reflected in computing the emotional well-being domain score. Data were collected at the baseline interview in each sample.

To measure recent changes in drug use, participants in the two treatment programs were asked about long-term drug use and about recent drug use (past 30 days). Since most participants in all three samples were cocaine users, cocaine use was measured. Cocaine use was measured on a 9-point scale, from 0 (''not used'') to 8 (''used 4 or more times per day''). Using this scale, participants were asked their cocaine use in the previous 12 months (residential campus sample) or in the previous 6 months (intensive outpatient sample) and in the past 30 days (both treatment samples). Participants in the community sample were asked the number of days they used cocaine in the past 30 days.

To test the hypotheses, an analysis of covariance (ANCOVA) was performed for each psychological and problem severity variable and domain. A variable that represented sample was used in each analysis as an independent variable. Because the three samples of drug users were selected using different procedures and because they differed somewhat in terms of demographic composition, each analysis also used the six demographic variables as statistical controls. Sample, gender, race/ethnicity, and primary drug were nominal variables and were introduced into ANCOVAs as fixed effects. Age, education, and employment were considered to be interval variables and were entered as covariates in these analyses.

Table 2. Treatment-Seeking Versus Community Drug Users

Domain variable	Community sample (n = 675) $\bar{x}$	Residential campus sample (n = 512) $\bar{x}$	Intensive outpatient sample (n = 224) $\bar{x}$	Main effect for sample F[a]	p
Assessed problem severity	2.45	3.25	3.25	133.74	.000
Drug problems	2.37	3.20	3.01	79.10	.000
Desire for help	2.53	3.30	3.49	167.81	.000
Cognitive functioning	2.34	2.48	2.55	23.52	.000
Decision making	2.34	2.44	2.51	9.12	.000
Risk taking[b]	1.72	1.67	1.55	8.98	.000
Social conformity	2.40	2.63	2.69	33.40	.000
Self-esteem	2.28	2.08	2.34	7.38	.001
Emotional well-being	2.40	2.44	2.63	11.44	.000
Anxiety[b]	1.69	1.71	1.48	3.97	.019
Depression[b]	1.61	1.69	1.45	5.26	.005
Hostility[b]	1.52	1.29	1.20	27.70	.000

[a] Main effect for sample (df = 2, 1052), controlling for gender, race/ethnicity, age, education, employment, and primary drug.

[b] Negative measure.

RESULTS

Means of the domain variables and their component scales are presented in Table 2 for the three samples. Results of ANCOVAs for differences in means of the three samples are reported. In each ANCOVA, means for the three samples were compared, controlling for gender, race/ethnicity, age, education, employment, and drug use. The overall F was found to be significant ($p < .01$) in all analyses. The main effect for sample is reported in Table 2. All domains, as well as their component variables, differed significantly among the three samples.

As predicted in Hypothesis 1, study participants who were applying for drug abuse treatment reported a higher level of perceived problem severity than community drug users. The differences in severity variables were reflected in the severity domain score. As predicted in Hypothesis 2, cognitive functioning variables were higher among study participants who were applying for treatment than among community drug users. The test of Hypothesis 3 gave results that failed to support the hypothesis. There was a significant main effect for sample for the emotional well-being domain, as well as for each emotional well-being variable, but these differences were not in the predicted direction. The emotional well-being variable scores for study participants in the intensive outpatient sample

were more favorable than the scores for participants in the community sample. Similarly, for the hostility variable and for the emotional well-being domain, study participants in the residential campus sample had more-favorable scores than the community sample. For the anxiety and depression variables, however, the residential campus sample did not have more-favorable scores than the community sample. Hypothesis 4 predicted that drug users enrolling in a drug treatment program would have lower self-esteem scores than out-of-treatment drug users. Although a significant effect for sample was found, the effects were in the predicted direction for the residential treatment sample only.

These results raised the question of whether the observed differences in problem severity might account for the observed differences in cognitive functioning and emotional well-being. To test this post hoc conjecture, the ANCOVAs of the cognitive and emotional variables and domains were repeated using problem severity as an additional covariate. Main effects for sample on cognitive functioning and emotional well-being domains and variables continued to be significant (data not reported). In addition, the ANCOVAs of the cognitive and emotional variables and domains were repeated using lifetime arrests as an objective measure of problem severity. Main effects for sample continued to be significant (data not reported). In a final analysis, a new ANCOVA was run with the number of lifetime arrests as the dependent variable and with sample and demographic controls as independent variables. There was no significant main effect for sample (data not reported).

Among those participants in the community sample who used cocaine in the previous 30 days, the mean cocaine use was 17.1 days out of 30. Among participants applying for the residential campus who used cocaine in the previous 30 days, the mean cocaine use was 5.4 on the 9-point scale, which corresponds approximately to 26 days out of 30. Among participants applying for the intensive outpatient program, the mean cocaine use was 3.1 on the 9-point scale in the previous 30 days, which corresponds approximately to 16 days out of 30. Among participants in the intensive outpatient program, cocaine use had dropped from 4.9 days over the previous 6 months ($p < .001$). Among participants in the residential campus sample, cocaine use had risen from 5.3 days over the previous 12 months (not a significant change). Anecdotal reports from intake counselors suggest that clients admitted to the treatment campus were much more often intoxicated at the time of intake than were clients at the intensive outpatient program. This suggests that those seeking treatment at the intensive outpatient program had completed some sort of self-directed recovery (or prerecovery) process prior to seeking treatment, while those seeking treatment at the treatment campus were still involved in chronic, frequent cocaine use at the time of seeking

treatment. The finding that self-esteem was lowest for those seeking treatment at the treatment campus supports this interpretation.

DISCUSSION

Two of the four hypotheses were fully supported. These hypotheses are consistent with both cognitive and 12-step theories. Drug users who presented themselves for treatment perceived their problems to be more severe than community drug users. The failure to find a group difference on the objective measure of problem severity (lifetime arrests) suggests that subjective problem severity may be more important than objective problem severity as a motivation to begin drug abuse treatment. However, caution is warranted here: because the item asked about lifetime arrests rather than recent arrests or other objective problems in the present, the evidence for subjective over objective problem severity is indirect.

The test of Hypothesis 2 gives support to the argument that the decision to begin drug abuse treatment involves adequate cognitive functioning (18, 44). Study participants who applied to begin drug abuse treatment reported higher levels of cognitive functioning than community drug users. The chemical effects of drugs are known to lower cognitive performance (28, 62). Drug users who decide to enter drug abuse treatment exhibit levels of cognitive functioning that are somewhat higher than the cognitive functioning of out-of-treatment drug users. Furthermore, those who have recently reduced their drug use (as have the intensive outpatient sample) have a higher level of cognitive functioning than those who have not significantly changed their drug use before entering drug abuse treatment (i.e., the residential treatment sample).

Hypothesis 3, derived from 12-step theory, predicted that drug users who enrolled in treatment programs would have lower levels of emotional well-being than community drug users. This hypothesis was not supported in these data. Descriptions of hitting bottom in 12-step theory conceptualize emotional distress as an aid in appreciating the severity of drug problems. The results reported here suggest the opposite: drug users who sought treatment in these samples felt better than out-of-treatment drug users. Those study participants who had applied to enter drug abuse treatment had higher emotional well-being scores than did community drug users, although the results were mixed for one of the drug treatment programs. An explanation for this result may be found in pretreatment changes in drug use. Applicants for the intensive outpatient program had the highest levels of emotional well-being and had significantly lowered their drug use in the 30 days prior to seeking treatment. Applicants for the residential campus had only

somewhat higher levels of emotional well-being than the community sample and had not significantly lowered their drug use in the 30 days prior to treatment. This result suggests that hitting bottom, if it occurs at all, may occur at a point in time closer to the time when the *decision* to seek treatment occurs than to the time when the *action* of seeking treatment occurs.

Hypothesis 4 was partially supported. According to 12-step theory, treatment seekers should have lower self-esteem than community drug users. The results reported above indicate that applicants to the intensive outpatient program had the highest self-esteem, followed by the community sample. Thus, the hypothesis was supported only for the residential treatment seekers. Applicants to the residential program had the lowest self-esteem scores. When these results are viewed in light of changes in drug use for the three groups, an interpretation similar to the one offered for emotional well-being can be offered. Residential treatment seekers and community drug users were similar to each other, and dissimilar to the intensive outpatient sample, in that neither had reduced their drug use significantly in the 30 days prior to the survey. Residential treatment seekers and intensive outpatient treatment seekers were similar to each other, and dissimilar to community drug users, in that both were aware of their drug problems and actively seeking help to overcome their addiction. Community drug users were not aware of their drug problems and were not seeking treatment, so their level of self-esteem may be regarded as a ''prechange'' level of self-esteem. Intensive outpatient treatment seekers had already experienced some success in reducing drug use prior to presenting for treatment, and this may be presumed to have given them some reason to raise their self-esteem. Residential treatment seekers, on the other hand, were aware of their drug problems and were actively seeking help, but were unable to report even short-term success in changing their behavior. Given this situation, a temporary reduction in self-esteem may be expected.

If treatment is viewed in light of stages of change, the above findings may be further clarified. Above, we noted that research into stage of change has located a ''corrective emotional experience'' in the transition between contemplation and action stages of change, and that this experience is described as if it involved emotional distress and a temporary lowering of self-esteem. In terms of the stages of change, the community sample may be regarded as being in the precontemplation stage of change for cessation of drug use since those who were in or currently seeking treatment were excluded from the sample. The awareness of drug problems and elevated desire for help of those in the residential treatment sample suggest that they may have progressed to the contemplation stage. Their presence at the treatment facility suggests they may have moved into the preparation stage, but the fact that they had not yet reduced their drug use suggests that they have

just entered the preparation stage. Finally, the intensive outpatient treatment sample had begun reducing their drug use as many as 30 days ago and were now seeking assistance in making still more changes. This suggests that they may have been moving from the preparation to the action stage of change.

According to Prochaska's classification (41), we would not expect improvements in emotional well-being to occur until clients had actually implemented some actions aimed at behavior change. Dramatic relief processes, involving the expression of feelings, will only lead to "a lowering of negative affect" if "the person actually changes" (41, p. 1109). Furthermore, the movement from contemplation to preparation is marked by ambivalence toward the self, which could be manifested as lowered self-esteem. If this is the case, then the difference between a drug user feeling bad and a drug user who had hit bottom is that the drug user who had hit bottom explicitly connects feeling bad with his or her drug problem and connects his or her drug problem with his or her self-concept.

There are some limitations in the data analyzed here. The three samples studied were not collected in the same manner, and while they are generally similar, they differ somewhat demographically. Each sample consisted of approximately two-thirds males and one-third females. In all samples, there was a higher proportion of African-American participants than Hispanic or Anglo participants. The majority in each sample had a high school education or less and were unemployed. The primary drug problem of each group was crack cocaine. All three samples were extracted from lower socioeconomic areas. In spite of these similarities, the samples differed significantly in race, age, employment, and drug use. However, the results reported above were achieved after applying statistical controls for the demographic variables.

The emotional and cognitive domains in this study were measured by a self-administered instrument. The question of respondent motivation is always an issue in self-administered questionnaires. It is possible that those deciding to enter treatment may have been more serious and careful in their responses than the community sample. On the other hand, the community sample was being paid for their participation, which may have elevated their commitment to the interview. The consistency of the results suggests that respondent motivation may not have been a significant factor. Many of the observed differences in the psychosocial scales were small, and no clinical norms have been established for these scales. However, previous work with these scales has shown that differences in the range of .15 to .40 have clinical significance (59).

The observed samples do not differ as much as in the similar comparison of in-treatment and community samples in Miami described by Chitwood and colleagues (63). We find the same age difference (community samples are older).

We do not find the same gender and education differences as in the Miami sample. We find employment differences, but the community sample has more employment, mostly part time, probably because the treatment campus targets indigent drug users. In comparison to the Yale sample collected by Rounsaville and Kleber (34), we do not find a gender difference. We find more Anglos and more African-Americans in treatment than on the street compared with the Miami and Yale samples.

The results of this study contrast in other ways with the results reported by Rounsaville and Kleber (34) and by Montoya and colleagues (35). Rounsaville and Kleber compared a treatment-seeking sample and community sample in New Haven, Connecticut (Yale University Drug Dependence Unit), and Montoya and colleagues compared drug users applying for research who requested inclusion in treatment studies to applicants requesting inclusion in nontreatment studies. Both of these studies found more direct support for the 12-step theory. In their measures of social relationships, Rounsaville and Kleber found that the treatment-seeking sample had lower levels of resources in the areas of social adjustment and leisure, extended family, and parental relationships. Montoya and colleagues found that applicants for treatment research had more current psychological distress, including higher depression and anxiety, than applicants for nontreatment research. Both of these studies found lower levels of emotional well-being among treatment seekers than were found in the Houston samples.

The Yale and Houston samples differ in time (by a decade) and in drug of choice (opiates and marijuana vs. cocaine), and the data differ in focus (social relationships and psychiatric symptoms vs. psychosocial resources). The Houston sample is also more homogeneous in terms of drug of choice than the sample used by Montoya and colleagues (35), which used marijuana, opiate, and cocaine users. Moreover, the decision to include marijuana smokers in the last sample may have led to self-selection effects. Applicants were directly encouraged to select their group, and marijuana smokers were significantly more heavily represented in the nontreatment group. One aspect of the Yale study may also have influenced their results. Their selection criteria for community users excluded drug users who had ever had any lifetime experience with drug treatment. Nurco and Schaffer (64) report that 77% of their community narcotics addicts had previous treatment experiences. In Houston, 38% of the community sample had previous drug treatment. The community drug users with previous experience of treatment reported significantly lower emotional well-being and higher problem severity than community users with no previous drug treatment experience (unreported data). If the Yale selection criteria for community drug users had been used in Houston, there might not have been a significant effect of positive effect

of emotional well-being on treatment seeking (although there still would not have been the negative effect found at Yale).

Twelve-step theory needs to be more clearly specified as to when hitting bottom occurs and how its occurrence is brought into the treatment process. The results here suggest that hitting bottom may be a short-lived experience that initiates the treatment-seeking process, but it does not appear to be an enduring condition that lasts until treatment is sought or that sustains the early parts of treatment. Hitting bottom may lead to a personal commitment to treatment, what Bateson calls a ''moment for change'' (20). This condition may then disappear until it is recalled as part of the treatment process. ''The *original* feeling of desperation, which is so quickly sealed over, will be resurrected by the group leader and discussed openly'' (62, p. 296, italics in original). Hitting bottom becomes an interpretive meaning assigned during treatment to one's previous life rather than an ongoing experience. One of the goals of treatment is to make the former pain real again, to re-create and relive the pain in order to sustain the commitment to recovery.

Although we find partial evidence of a real hitting bottom experience that involves low self-esteem, we are led by these results to expect that much of the hitting bottom experience as it affects recovery may be a reframing process (65–67). It may be in the reframing process that the drug user interprets prior experience as hitting bottom, when prior control of drugs is reinterpreted as control by drugs (20). Hitting bottom may become a retrospective ''reorganization of the conversational apparatus'' (65, p. 159) as the former user constructs an account of the decision to give up drugs. One of the goals of treatment may thus be to help the user to construct a memory of hitting bottom as a technique for recovery in therapy (68). If this is true, clients in treatment may succeed not because they remain ''at bottom,'' but because they are able to re-create the feelings of previously having been ''at bottom'' as a motivation to continue to work on maintaining sobriety.

ACKNOWLEDGMENTS

Support for this research was provided by grants from the National Institute on Drug Abuse (U01 DA06906) and the Texas Commission on Alcohol and Drug Abuse (16-0550-953-CAM and 16-0525-941–SPS) to the collaborating investigators. The authors would like to thank Tina McPherson and Elizabeth Graves for the preparation of this manuscript for submission and William N. Elwood

and the anonymous reviewers for their helpful comments. Opinions expressed herein are solely those of the authors.

REFERENCES

1. De Leon, G., and Jainchill, N., Circumstance, motivation, readiness and suitability as correlates of treatment tenure, *J. Psychoactive Drugs* **18**:203–208 (1986).
2. Miller, W. R., Motivation for treatment: A review with special emphasis on alcoholism, *Psychol. Bull.* **98**(1):84–107 (1985).
3. Holt, W. E., The concept of motivation for treatment, *Am. J. Psychiatry* **123**(11):1388–1395 (1967).
4. Sterne, M. W., and Pittman, D. J., The concept of motivation: A source of institutional and professional blockage in the treatment of alcoholics, *Q. J. Stud. Alcohol* **26**:41–57 (1965).
5. Bandura, A., *Social Learning Theory*, Prentice-Hall, Englewood Cliffs, New Jersey, 1977.
6. Bandura, A., Social cognitive theory and exercise of control over HIV infection, in *Preventing AIDS: Theories and Methods of Behavioral Interventions* (R. J. DiClemente and J. L. Peterson, Eds.), Plenum Press, New York, 1994, pp. 25–59.
7. Coleman, J. S., *Foundations of Social Theory*, Harvard University Press, Cambridge, Massachusetts, 1990.
8. Becker, M. H., The health belief model and personal health behavior, *Health Educ. Monogr.* **2**:324–508 (1974).
9. Janz, N. K., and Becker, M. H., The health belief model: A decade later, *Health Educ. Q.* **11**: 1–47 (1984).
10. Ajzen, I., and Fishbein, M., *Understanding Attitudes and Predicting Social Behavior*, Prentice-Hall, Englewood Cliffs, New Jersey, 1980.
11. Fishbein, M., A theory of reasoned action: Applications and implications, in *Nebraska Symposium on Motivation 1979* (H. E. Howe and M. M. Page, Eds.), University of Nebraska, Lincoln, 1980, pp. 65–116.
12. Fishbein, M., Middlestadt, S. E., and Hitchcock, P. J., Using information to change sexually transmitted disease-related behaviors: An analysis based on the theory of reasoned action, in *Research Issues in Human Behavior and Sexually Transmitted Diseases in the AIDS Era* (J. N. Wasserheit, S. O. Aral, and K. K. Holmes, Eds.), American Society for Microbiology, Washington, D.C., 1991, pp. 243–257.
13. Ajzen, I., From intentions to actions: A theory of planned behavior, in *Action Control: From Cognition to Behavior* (J. Kuhl and J. Beckman, Eds.), Springer-Verlag, Berlin, 1985, pp. 11–39.
14. Prochaska, J. O., and DiClemente, C. C., Stages of change in the modification of problem behaviors, in *Progress in Behavior Modification*, Vol. 28 (M. Hersen, R. M. Eisler, and P. M. Miller, Eds.), Sycamore, New York, 1992, pp. 184–218.
15. Bowen, A. M., Predicting increased condom use with main partners: Potential approaches to intervention, *Drugs and Soc.* **9**(1/2):57–74 (1996).
16. Albrecht, T. L., and Adelman, M. B., *Communicating Social Support*, Sage Publications, Newbury Park, California, 1987.
17. Becker, M. H., Psychosocial aspects of health-related behavior, in *Handbook of Medical Sociology* (H. Freeman, S. Levine, and L. Reeder, Eds.), Prentice-Hall, Englewood Cliffs, New Jersey, 1979, pp. 253–274.
18. Marlatt, G. A., Baer, J. S., Donovan, D. M., et al., Addictive behaviors: Etiology and treatment, *Annu. Rev. Psychol.* **39**:223–252 (1988).

19. Alcoholics Anonymous, *Alcoholics Anonymous* (AA's Big Book), Alcoholics Anonymous World Service, New York, 1953.
20. Bateson, G., The cybernetics of ''self'': A theory of alcoholism, *Psychiatry* **34**:1–18 (1971).
21. Buxton, M. E., Smith, D. E., and Seymour, R. B., Spirituality and other points of resistance to the 12-step process, *J. Psychoactive Drugs* **19**:275–286 (1987).
22. Thompson, D. L., and Thompson, J. A., Working the 12 steps of Alcoholics Anonymous with a client: A counseling opportunity, *Alcohol. Treatment Q.* **10**(1/2):49–61 (1993).
23. Watson, L., Paradigms of recovery: Theoretical implications for relapse prevention alcoholics, *J. Drug Issues* **21**:839–858 (1991).
24. Bristow-Braitman, A., Addiction recovery: 12-step programs and cognitive-behavioral psychology, *J. Counseling Dev.* **73**:414–418 (1995).
25. Tiebout, H. M., Alcoholics Anonymous—An experiment of nature, *Q. J. Stud. Alcohol* **22**:52–68 (1961).
26. Gorski, T. T., *Understanding the 12 Steps: An Interpretation and Guide for Recovering People*, Prentice-Hall/Parkside, New York, 1989.
27. W., K., *Twelve Steps to Freedom: A Recovery Workbook*, Crossing Press, Freedom, California, 1991.
28. Miller, N. S., and Mahler, J. C., Alcoholics Anonymous and the ''AA'' model for treatment, *Alcohol. Treatment Q.* **8**:39–51 (1991).
29. Dabrowski, K., *Personality Shaping Through Positive Disintegration*, Little, Brown, Boston, 1967.
30. Kristeva, J., *Black Sun: Depression and Melancholia*, trans. L. Roudiez, Columbia University Press, New York, 1989.
31. Nordström, G., and Berglund, M., Successful adjustment in alcoholism: Relationships between causes of improvement, personality, and social factors, *J. Nerv. Ment. Dis.* **174**(11):664–668 (1986).
32. Brill, L., *The De-addiction Process*, Thomas, Springfield, Illinois, 1972.
33. Biernacki, P., *Pathways from Heroin Addiction: Recovery Without Treatment*, Temple University, Philadelphia, 1986.
34. Rounsaville, B. J., and Kleber, H. D., Untreated opiate addicts: How do they differ from those seeking treatment? *Arch. Gen. Psychiatry* **42**:1072–1077 (1985).
35. Montoya, I. D., Haertzen, C., Hess, J., et al., Comparison of psychological symptoms between drug abusers seeking and not seeking treatment, *J. Nerv. Ment. Dis.* **183**(1):50–53 (1995).
36. Gawin, F. H., and Kleber, H. D., Abstinence symptomatology and psychiatric diagnosis in cocaine abusers, *Arch. Gen. Psychiatry* **43**:107–113 (1986).
37. Rounsaville, B. J., Anton, S., Carroll, K. M., et al., Psychiatric diagnosis of treatment-seeking cocaine users, *Arch. Gen. Psychiatry* **48**:43–51 (1991).
38. Weiss, R. D., Mirin, S. M., Michael, J. L., et al., Psychopathology in chronic cocaine abusers, *Am. J. Drug Alcohol Abuse* **12**:17–29 (1986).
39. Weiss, R. D., Mirin, S. M., Griffin, M. L., et al., Psychopathology in cocaine abusers: Changing trends, *J. Nerv. Ment. Dis.* **176**:719–725 (1988).
40. Prochaska, J. O., Velicer, W. F., DiClemente, C. C., et al., Measuring processes of change: Applications to the cessation of smoking, *J. Consult. Clin. Psychol.* **56**(4):520–528 (1988).
41. Prochaska, J. O., In search of how people change: Applications to addictive behaviors, *Am. Psychol.* **47**:1102–1114 (1992).
42. Prochaska, J. O., and DiClemente, C. C., Common processes of self-change in smoking, weight control, and psychological distress, in *Coping and Substance Abuse* (S. Shiffman and T. A. Wills, Eds.), Academic Press, New York, 1985, pp. 345–364.
43. Twerski, A. J., *I'd Like to Call for Help, But I Don't Know the Number: The Search for Spirituality in Everyday Life*, Pharos, New York, 1991.
44. McLellan, A. T., Luborsky, L., Woody, G. E., et al., Predicting response to alcohol and drug abuse treatments: Role of psychiatric severity, *Arch. Gen. Psychiatry* **40**:620–625 (1983).

45. Perri, M. G., Self-change strategies for the control of smoking, obesity, and problem drinking, in *Coping and Substance Use* (S. Shiffman and T. A. Wills, Eds.), Academic Press, Orlando, Florida, 1985, pp. 295–317.
46. Rawson, R. A., Obert, J. L., McCann, M. J., et al., Neurobehavioral treatment for cocaine dependency, *J. Psychoactive Drugs* **22**:159–171 (1990).
47. Simpson, D. D., *Description of the DATAR Admission Process and Intake Form*, Institute of Behavioral Research, Texas Christian University, Fort Worth, Texas 1990.
48. Knight, K., Holcom, M., and Simpson, D. D., *TCU Psychosocial Functioning and Motivation Scales: Manual on Psychometric Properties*, Institute of Behavioral Research, Texas Christian University, Fort Worth, Texas, 1994.
49. Bandura, A., *Social Foundations of Thought and Action: A Social Cognitive Theory*, Prentice-Hall, Englewood Cliffs, New Jersey, 1986.
50. Elliott, D. S., Huizinga, D., and Ageton, S. S., *Explaining Delinquency and Drug Use*, Sage, Newbury Park, California, 1985.
51. Basch, M. F., *Understanding Psychotherapy: The Science Behind the Art*, Basic Books, New York, 1988.
52. Gladding, S. T., *Counseling: A Comprehensive Profession*, 2nd ed., Macmillan, New York, 1992.
53. Miller, W. R., and Hester, R. K., The effectiveness of treatment techniques: What works and what doesn't, in *Alcoholism: Theory, Research and Treatment* (W. R. Miller, Ed.), Ginn, Lexington, Massachusetts, 1985, pp. 526–574.
54. Rogers, C. R., *A Way of Being*, Houghton Mifflin, Boston, 1980.
55. Coopersmith, S., *The Antecedents of Self Esteem*, Freeman, San Francisco, 1967.
56. Skager, R., and Kerst, E., Alcohol and drug use and self-esteem: A psychological perspective, in *The Social Importance of Self-Esteem* (A. M. Mecca, N. J. Smelser, and J. Vasconcellos, Eds.), Berkeley, California, 1989, pp. 248–293.
57. Kemper, T. D., *A Social Interactional Theory of Emotions*, Wiley, New York, 1978.
58. Bell, D. C., The effect of psychosocial domains on AIDS risk behaviors, *Drugs and Soc.* **9**(1–2):37–55 (1996).
59. Bell, D. C., Richard, A. J., and Feltz, L. C., Mediators of drug treatment outcomes, *Addict. Behav.* **21**(5):597–614 (1996).
60. Bell, D. C., Williams, M. L., Nelson, R., et al., A pilot study of client progress in short-term drug abuse treatment, *J. Psychoactive Drugs* **27**(3):211–221 (1995).
61. Cohen, J., *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed., Lawrence Erlbaum, Hillsdale, New Jersey, 1988.
62. Muhleman, D., 12-step study groups in drug abuse treatment programs, *J. Psychoactive Drugs* **19**:291–298 (1987).
63. Chitwood, D. D., Rivers, J. R., Comerford, M., et al., A comparison of HIV related risk behaviors of street recruited and treatment program recruited injection drug users, in *AIDS and Community-Based Drug Intervention Programs: Evaluation and Outreach* (D. G. Fisher and R. H. Needle, Eds.), Haworth, New York, 1993, pp. 53–63.
64. Nurco, D. N., and Shaffer, J. W., Types and characteristics of addicts in the community, *Drug Alcohol Dependence* **8**:43–78 (1982).
65. Berger, P., and Luckmann, T., *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*, Doubleday, Garden City, New York, 1966.
66. Ehrlich, P., and McGeehan, M., Cocaine recovery support groups and the language of recovery, *J. Psychoactive Drugs* **17**:11–17 (1985).
67. Kurtz, E., Why A. A. works, *J. Stud. Alcohol* **43**:38–80 (1982).
68. DiCicco, L., Unterberger, H., and Mack, J. E., Confronting denial: An alcoholism intervention strategy, *Psychiatr. Ann.* **8**:596–606 (1978).