Individual and Contextual Predictors of Involvement in Twelve-Step Self-Help Groups After Substance Abuse Treatment[1]

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Drawing on ecological and narrative theories of self-help groups, this study tests a multilevel model predicting self-help group involvement among male veterans who received inpatient substance abuse treatment. Following K. Maton (1993), the study moves beyond the individual-level of analysis to encompass variables in the treatment and post-treatment social ecology. Surveys administered to patients (N = 3,018) and treatment staff (N = 329) assessed these predictor domains and self-help group involvement 1 year after discharge. A hierarchical linear model fit to the data indicates that greater involvement in 12-step groups after discharge is predicted by the compatibility between personal and treatment belief systems. The implications of these findings for efforts to facilitate transitions between inpatient professional treatment and community-based self-help groups are discussed.

KEY WORDS: self-help; substance abuse; hierarchical linear model; veterans.

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Twelve-step self-help groups such as Narcotics Anonymous (NA; Peyrot, 1985) are an important resource for individuals with substance abuse problems. Alcoholics Anonymous (AA) is the most utilized form of help for alcohol problems (Emrick, Tonigan, Montgomery, & Little, 1993; Ogborne, 1993; Weisner, Greenfield, & Room, 1995), and the majority of professionally treated substance abuse patients are referred to 12-step groups (Humphreys, 1997). Even so, a sizable proportion of patients never attend such groups as part of their care after discharge (McKay et al., 1998). Moreover, many people who try self-help groups drop out after the first few meetings (Luke, Roberts, & Rappaport, 1993). Clearly, self-help groups are an important resource for people with substance abuse problems, but not enough is known about how potential members become and stay involved. Increased understanding of the factors that predict participation in self-help groups could enable professionals to modify treatment programs and professional practice in ways that would facilitate substance abuse patients' transition into self-help groups. It might also assist self-help group facilitators and training organizations to develop a better understanding of the constellation of factors that are most conducive to participation (Meissen, Gleason, & Embree, (1991).

Several studies have attempted to identify and test the predictive utility of factors associated with self-help group participation. For example, studies examining members' demographic and clinical characteristics have found that more severe substance abuse and psychosocial problems (Humphreys, Mavis, & Stofflemayr, 1991; McKay et al., 1998), and higher level of education and age (Luke et al., 1993) predict attendance at self-help meetings. Although these studies provide some indication of who is more likely to attend a 12-step self-help group, they provide only a partial picture of the forces influencing participation in self-help groups.

More specifically, an approach emphasizing individual factors in self-help participation limits understanding by giving insufficient attention to contextual and ecological factors in behavior (Maton, 1989, 1993). Ecological theories in community psychology suggest that behavior be analyzed as a function of individual characteristics and aspects of the person's life context, as well as the match or fit between individuals and their life contexts (McPherson, 1983; Moos, 1987; Trickett, Kelly, & Vincent, 1985). Research has shown that the match between individual factors such as demographic and personality variables, as well as aspects of the life context or situation affect whether people join groups (Luke et al., 1993). People are more likely to join groups whose goals and values are consistent with their own (Sherif & Sherif, 1953) or which are composed of others facing similar situations (Gump & Kulik, 1997).

Theories of social ecology that emphasize person–environment fit also suggest viewing participation in a self-help group as an issue of environmental transition (Felner, Ginter, & Primavera, 1982; Hanson, Foreman, Tomlin, & Bright, 1994). Becoming involved in an environment requires the navigation of border points between groups, organizations or institutions. Barriers may exist at these border points that may increase the difficulty of gaining needed assistance or services. The transition between treatment environments may be affected by the fit between a person and the new environment, impacting how easily and to what degree the person is able to navigate this transition. The match between individual and environmental characteristics might promote or impede the transition into a self-help group.

This view of group participation, which emphasizes the match of members' experiences and values to the group, is consistent with recent conceptualizations of self-help groups as "communities of belief" (Antze, 1976; Kennedy & Humphreys, 1994; Rappaport, 1993). The narrative view of self-help highlights how members exchange personal stories about their substance abuse as a way of creating a shared discourse representing the common beliefs, values, and norms of the group. Members draw upon this narrative to reauthor their personal stories, identity, and worldviews in ways that correspond to those of others in the group (Mankowski & Rappaport, 1995). Members shape and are shaped by participation in this storytelling discourse, which functions as an alternative to culturally dominant forms of understanding the members' situation or problem. From this view, the degree of correspondence or compatibility between potential members' own beliefs and understandings and those in a given self-help group could be especially important in determining the person's level of attraction to and involvement in the group. Therefore, in trying to predict involvement in self-help groups, it may be important to measure those individuals' beliefs, goals, and aspects of identity that are central to the culture of the self-help group. The degree of similarity or compatibility between personal and self-help group belief systems may predict how attractive the group is seen to be and how involved the person becomes. The correspondence between aspects of a person's social ecology would also be important to consider in this respect. For example, if the beliefs, goals, and values of important people in the person's social network are similar to those in the self-help group, this may increase the level of familiarity with and attraction to the group.

Finally, in addition to the degree of fit between members and groups, social ecological theory suggests that additional contextual factors may directly affect the likelihood of participation in a group (Maton, 1993). For example, the social and physical environment can vary in the amount of resources

such as the availability of self-help group meetings or clearinghouses, and the number of individuals attending self-help group meetings who are potentially available as contacts or sponsors. These resources can directly affect participation levels by easing the costs associated with involvement (e.g., travel time to meetings) or increasing the rewards (e.g., having sponsors who live nearby).

Applying social ecological theory to the specific case of substance abuse patients' transition from inpatient treatment to community-based 12-step self-help groups suggests that self-help involvement is a function of individual beliefs and characteristics, as well as conceptually related aspects of the treatment and post-treatment social ecology. Figure 1 displays this framework as a version of a more comprehensive model of the relationship between stressors, resources, coping, and affiliation with self-help groups that has been previously validated (see Humphreys et al., 1994; Humphreys, Mankowski, Moos, & Finney, 1999). *Individual beliefs* about substance abuse, religion, and spirituality correspond to key dimensions of belief systems in 12-step self-help groups and therefore should predict involvement. If some patients hold beliefs about substance abuse that are similar to those guiding 12-step self-help groups, then those patients should find the group consistent with their own world view and be able to participate more readily. Beliefs that characterize 12-step groups for substance abuse include a view of addiction as a disease that requires total abstinence (Humphreys, Greenbaum, Noke, & Finney, 1996) and a belief in a spiritual force or "higher power." Consequently, patients who hold stronger religious or spiritual beliefs or are engaged in religious practices, who believe in a disease model of addiction, and who begin treatment with the goal of abstinence should find 12-step groups more consistent with their world view, and hence become more involved in them. Consistent with this hypothesis, Maton (1989) found that personal spirituality was positively related to group satisfaction among members of 12-step (but not non–12-step) self-help groups that emphasize reliance on a "higher power" (see also, Humphreys & Woods, 1993).

Individual characteristics including demographic variables and clinical variables such as substance abuse problem severity should also discriminate among levels of self-help involvement. Based on previous research, important demographic variables include age, education, employment, racial majority status, and prior self-help involvement. Many of these variables likely are proxies for other factors that are more directly related to 12-step self-help groups and their beliefs about substance abuse. For example, being a member of a racial majority within the group could be important because people are more comfortable in groups of similar others, and therefore more likely to sustain involvement in a group. Patients with more years of education and
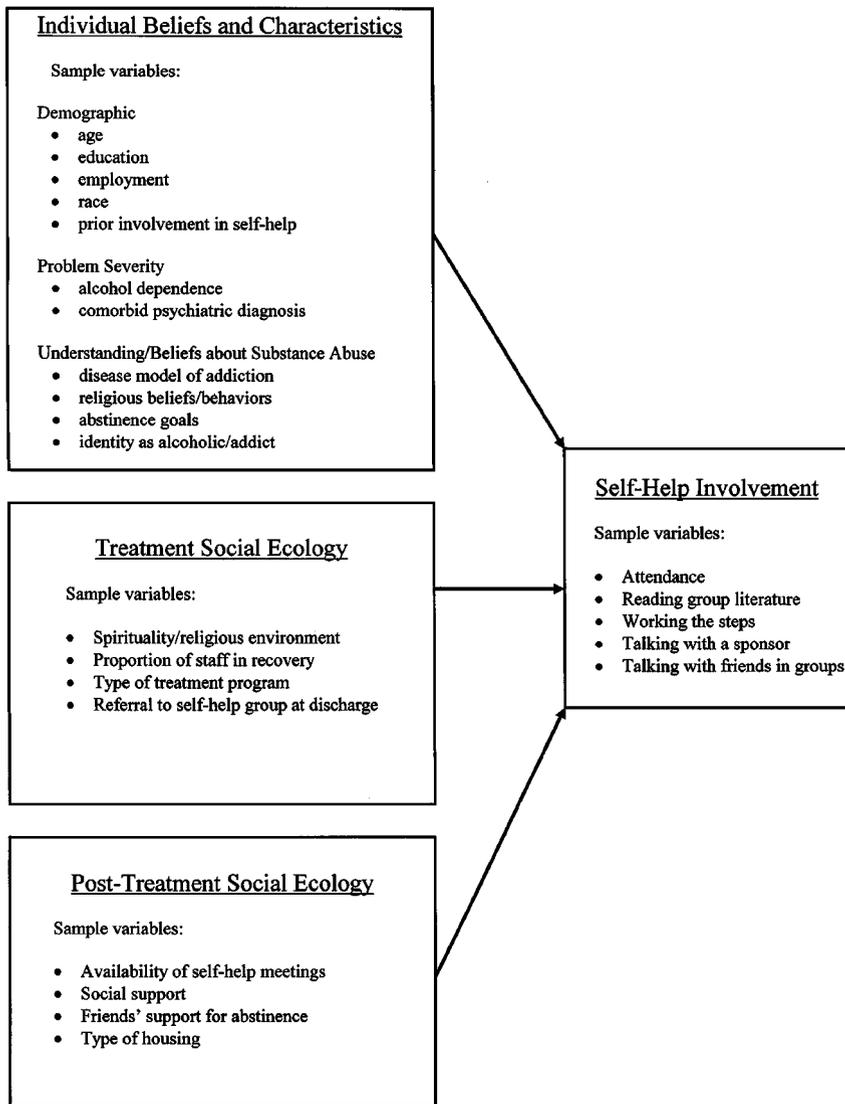
Individual Beliefs and Characteristics

Sample variables:

Demographic
- age
- education
- employment
- race
- prior involvement in self-help

Problem Severity
- alcohol dependence
- comorbid psychiatric diagnosis

Understanding/Beliefs about Substance Abuse
- disease model of addiction
- religious beliefs/behaviors
- abstinence goals
- identity as alcoholic/addict

Self-Help Involvement

Sample variables:

- Attendance
- Reading group literature
- Working the steps
- Talking with a sponsor
- Talking with friends in groups

Treatment Social Ecology

Sample variables:

- Spirituality/religious environment
- Proportion of staff in recovery
- Type of treatment program
- Referral to self-help group at discharge

Post-Treatment Social Ecology

Sample variables:

- Availability of self-help meetings
- Social support
- Friends' support for abstinence
- Type of housing

Fig. 1. Model predicting self-help group involvement from individual beliefs and characteristics, treatment social ecology, and post-treatment social ecology (based on Humphreys, Finney, & Moos, 1994, p. 315).

more stable employment may possess greater verbal skills, which are well-suited to the self-help group environment that often rewards self-disclosure and storytelling. As discussed earlier, severity of substance abuse and associated psychological problems may predict attendance at 12-step self-help groups because patients with more severe problems may need and utilize multiple forms of help including both professional treatment and self-help groups more frequently. Finally, patients who have had more involvement in self-help groups for substance abuse prior to receiving professional treatment should be more likely to participate in them after treatment as well. In the absence of some intervention or change, past motivations for and decisions about attending these groups are likely to influence future behavior.

Specific aspects of the *treatment social ecology* should also contribute to involvement in self-help groups following substance abuse treatment. For example, some treatment programs include 12-step groups, place importance on abstinence as the desired treatment outcome, and have staff members who are themselves recovering from substance abuse (Humphreys, Noke, & Moos, 1996). Staff members' referrals may encourage patients to attend 12-step meetings (Humphreys, 1997). In making referrals, staff members can validate attendance at self-help groups and provide concrete details about the location and time of group meetings in the local area. Both actions may facilitate transitions between professional treatment and self-help group environments.

The prevalence of religious practices and resources in the treatment program environment may also be related to patients' subsequent participation in spiritually based 12-step groups. The encouragement of religious practices (e.g., attending religious services, prayer) in treatment, the presence of spiritual materials (e.g., the Bible, the Big Book of AA), and the expression of spiritual beliefs by staff and fellow patients may create a treatment environment that is similar to and encourages involvement in 12-step groups.

Finally, the *post-treatment social ecology* may also facilitate or hinder involvement in self-help groups (Moos, Finney, & Cronkite, 1990). For example, the quality and availability of social resources may determine whether additional sources of support such as a self-help group are sought. People with friends who encourage and support efforts to abstain from substance use may become more involved in self-help groups (Humphreys, Mankowski, Moos, & Finney, 1999) because these friends are similar to those who they might find in a self-help group. Similarly, one study showed that adolescents affiliated with AA are more likely to have friends who do not use drugs (Hohman & LeCroy, 1996).

A final relevant aspect of the post-treatment social ecology concerns the availability of self-help groups. One major advantage of self-help meetings is

that they are typically highly available, and are more available than professional treatment. The relative availability of local self-help group meetings in different environments might be related to the likelihood of participation. When self-help groups are less accessible, attendance drops off. For example, lack of transportation and a long distance to meetings are common reasons for dropping out of a self- help group (Mankowski, Maton, Burke, Hoover, & Anderson, 2000). For these reasons, living in group housing (e.g., halfway house; homeless shelter) may be positively related to self-help involvement because such settings often provide relatively easy access to self-help group meetings. Self-help groups are more likely to be available in group housing; members of halfway homes often have easy accessibility to self-help groups and, consequently, high levels of involvement (e.g., see Nealon-Woods, Ferrari, & Jason, 1995). Furthermore, group housing may provide easier access to case managers or professionals who can recommend treatment plans including attendance at self-help meetings.

GOALS OF THE STUDY

Based on this review of the literature, we conducted an exploratory study to determine whether these aspects of the treatment and post-treatment ecology, as well as personal belief systems predict self-help involvement. One purpose was to determine whether the prediction of self-help group participation from individuals' demographic and clinical characteristics could be improved by also considering one's identity as an alcoholic or addict and beliefs about substance abuse, specifically those that are central themes of narratives in 12-step self-help groups, such as religious beliefs, abstinence as a goal, and the disease model of addiction. Individuals whose preexisting belief systems are more similar to those that guide 12-step self-help groups should be more likely to participate in a group. This hypothesis was based specifically on the concept of person–environment fit (Pargament, 1986) which suggest that a match between individuals and the self-help environment will influence the degree of self-help involvement. In addition, the prediction is based on narrative theories of self-help, which view groups as communities of belief (Antze, 1976, Kennedy & Humphreys, 1994; Mankowski & Rappaport, 1995).

A second purpose of the exploratory study was to determine whether prediction of self- help participation based on individual characteristics could be improved by assessing social ecological variables, especially ones representing important aspects of the narratives or belief systems of 12-step self-help groups for substance abuse. In particular, we wanted to determine whether the addition of variables characterizing the belief system and

practices of inpatient substance abuse treatment environments would improve prediction of participation. This hypothesis was derived from social ecological theory which suggests that the fit between variables at multiple levels of analysis are needed to understand self-help group participation (Maton, 1993). Similarly, theory regarding transitions between treatment settings (Felner et al., 1982) describes how integrated social environments facilitate involvement and adaptation.

In summary, assessment of individual belief systems and characteristics, as well as corresponding aspects of the social ecology, should improve prediction and provide a more comprehensive understanding of involvement in self-help groups. We conducted a longitudinal study to evaluate the predictive utility of variables in these domains, using data obtained from a large survey of male veterans, their treatment staff, and patient records. Data from veterans were collected at intake into inpatient substance abuse treatment programs and at follow-up, 1 year after discharge.

METHOD

Participants

Participants were male veterans who received inpatient treatment for substance abuse at 1 of 15 Veterans Affairs programs in the United States, and the treatment staff at these programs. The programs were classified as offering either 12-step, cognitive–behavioral, or a blend of these types of treatment programs (see Ouimette, Finney, and Moos, 1997, for further details on how programs were selected and classified). Patients were typically in the programs for 3–4 weeks. The programs served 20–40 patients at a time and were staffed by 10–20 professionals – physicians, psychologists, social workers, nurses, therapists, and rehabilitation and vocational counselors.

Patients

Of the sample of patients invited to participate in the project at their intake into treatment, 88% ($n = 3,698$) completed the survey. Of those who completed the intake measures, 3,018 (82%) were successfully contacted 1 year after their discharge and completed a follow-up survey (for further details, see Ouimette et al., 1997). Follow-up participants and nonparticipants were compared to determine whether any factors associated with attrition could be identified. No differences ($p > .05$) were found for age, education, ethnicity, income, employment status, or symptoms of alcohol dependence at intake.

At intake, the 3,018 participants averaged 43 years of age ($SD = 9.6$), a high school level of formal education ($M = 12.72$ years, $SD = 1.8$), were typically unemployed (76.2%; $N = 2,301$), and had low incomes ($M = \$10,670/$ year, $SD = \$9,421$). About 49% were African American, 46% non-Hispanic White, 3% Hispanic/Latino, and 2% either Asian, Native American, or another ethnic group. Most were not currently married (81%). A majority reported affiliation with a Protestant religion (58%), with the remainder reporting Catholic (19%), some Other (12%), and some had no religious affiliation (11%). Patients had primary clinical ICD-9-CM diagnoses of alcohol dependence (42%), drug dependence (17%), or both (40%).

Treatment Staff

In order to obtain measures of the treatment programs and environment, staff at the 15 Veterans Affairs programs were also invited to participate in the study. Eighty-six percent ($N = 329$) consented and completed the survey described here. Staff were mostly Caucasian (62%; 28% were African American, 3.0% were Asian, 2.7% were Latino, 1.5% were Native American, and 3.0% were from other racial and ethnic groups), female (55%), and averaged 46.8 years of age, 16.7 years of formal education, 5.6 years of working at the site, and 21.7 hr per week in face-to-face contact with the patients. About 15% were themselves in recovery from substance addiction.

Measures

Self-help Group Involvement

Because self-help group involvement is a multifaceted construct, we assessed, at intake into treatment and at 1 year after discharge, a number of aspects of involvement, including attending meetings, reading group literature, working the steps, talking with a sponsor, and talking with friends in 12-step groups (see Tonigan, Connors, and Miller, 1996). One item assessed attendance by asking how many 12-step group (AA/NA/CA) meetings were attended in the past 3 months (5 response options were: $0 =$ no meetings, $1 = 1$–9 meetings, $2 = 10$–19 meetings, $3 = 20$–29 meetings, and $4 = 30$ or more meetings). Degree of working the 12-steps was assessed by asking whether the person had tried to incorporate each step into his daily life in the past year (yes/no response for each step; summed and coded to produce a 5-point scale ranging from $0 = 0$ steps, $1 = 1$–3 steps, $2 = 4$–6 steps, $3 = 7$–9 steps, and $4 = 10$–12 steps). Examples of the 12-steps are as follows:

"Made a decision to turn my will and life over to the care of God," "Made a list of all I had harmed and became willing to make amends to all." Reading group literature was assessed by a single item asking about the frequency of reading the big Book and other 12-step literature (5-point response scale ranged from *never* to *several times a week*). Frequency of talking with a 12-step sponsor and friends active in 12-step groups were assessed using the same response options. The sum of these five 5-point scales was used as the overall summary score for *self-help involvement* (range = 0–20). The scale was internally reliable ($\alpha = .83$ for 1 year follow-up, $\alpha = .67$ for intake).

Individual Beliefs and Characteristics

As part of the survey administered at treatment intake, we assessed the following participant characteristics. Demographic variables included *age, years of education, degree of employment* (0 = none, 1 = part-time, 2 = full time), and *racial majority* (non-Hispanic white = 1, African American, Asian, Hispanic, and Native American = 0). Race was dichotomized because we were interested in how the experience of being in the racial minority versus majority might be related to self-help involvement, and how this membership status might be related to whether the men felt a part of the self-help "community of belief." In addition, the sample did not include a sufficient number of men from all races to allow us to test the model separately on each racial group (95% of the sample was African American or non-Hispanic white). Variables indicating problem severity included alcohol dependence and comorbid diagnosis. *Alcohol dependence* was assessed by a 9-item scale designed to measure the criteria for alcohol dependence as given in the third revised edition of the *Diagnostic and Statistical Manual* (American Psychiatric Association, 1987), with higher scores indicating a greater degree of dependence on alcohol (range = 0–36; $\alpha = .94$). Further details are reported in Ouimette et al. (1997). *Comorbid psychiatric diagnosis* was a dichotomous variable representing patients who received only an ICD-9-CM substance abuse related clinical diagnosis from staff (coded 0) versus those with additional psychiatric diagnoses, such as affective, psychotic, anxiety or personality disorders (coded 1).

Variables indicating patients' understanding of and beliefs about substance abuse included endorsement of the *disease model of alcoholism and addiction*, which was assessed with a 4-item subscale ($\alpha = .70$) from the Short Understanding of Substance Abuse Scale (SUSS; Humphreys et al., 1996; Moyers & Miller, 1993). The full scale has convergent and discriminant validity and is unaffected by yea-saying bias (Humphreys et al., 1996). The disease model holds that alcoholism and drug addiction are incurable

diseases with severe consequences that can be arrested through complete abstinence, but never cured. *Religious beliefs and behavior* was assessed by six items asking about the frequency with which one has engaged in religious activities or held religious beliefs (Connors, Tonigan, and Miller, 1996). Commitment to an *abstinence goal* for treatment was assessed by a single item ranging from "no personal goal" to "I want to achieve total abstinence, and never use alcohol or drugs again" (Marlatt, Curry, & Gordon, 1988). Finally, in order to assess a central aspect of the patient's *identity as an alcoholic or addict*, two yes/no-response items (0 = no to both items; 1 = yes to either item) asked: "Do you consider yourself to be an alcoholic" or "drug addict?"

Treatment Social Ecology

All treatment staff were mailed a survey, and follow-up letters were sent to encourage participation. The anonymous survey assessed the following domains of the treatment environment:

Spiritual/Religious Treatment Environment. A 10 true/false item scale ($\alpha = .77$) was developed to assess a program's emphasis on spirituality or religion and how this affects the social environment of the program. Sample items are the following: "Bibles and other religious reading materials are readily available," "Staff encourage patients to attend religious services," and "Some of our group sessions end with the Serenity Prayer." The staff mean for each program was assigned to each patient within that program.

Proportion of Staff in Recovery. This was determined from the percentage of staff within a site who answered "yes" to the question: "At the present time, are you in recovery from alcoholism or another drug addiction?" Each patient within a site was assigned a value reflecting the proportion of staff in recovery.

12-Step Treatment Program. Based on site visits that included interviews with the program director and staff members' responses to the Drug and Alcohol Program Treatment Inventory (DAPTI; Swindle, Peterson, Paradise, & Moos, 1995) and SUSS, the 15 programs were also classified as either a 12-step, cognitive–behavioral, or eclectic (combined; Moos, Finney, Ouimette, & Suchinsky, 1999) one. For this study, in order to make a more strict comparison between programs that had substantially more versus less emphasis on 12-step goals and activities, 12-step and eclectic programs were combined (code = 1) and compared with cognitive–behavioral programs (code = 0).

Referral to Self-Help Group. Finally, based on patients' medical charts, a code was assigned to indicate whether a staff member recommended attendance at 12-step groups at discharge (1 = yes; 0 = no).

Post-treatment Social Ecology

Availability of Self-Help Meetings. A measure of self-help group meeting availability was obtained by comparing the number of self-help group meetings (including AA, NA, and CA) per week in each program city to the geographic area of that city (measured in square miles). Number of meetings was determined by telephoning the central offices of AA, NA, and CA for the cities in which Vaterans Affairs facilities were located and asking how many meetings there were each week, or by counting each meeting from meeting listings or hot line schedules. The ratio of meetings to geographic area ranged from 1.27 to 17.78 meetings per square mile ($M = 7.41$, $SD = 5.03$).

Social Support. Social support from friends was measured at intake using the 6-item friendship resources scale ($\alpha = .74$) of the Life Stressors and Social Resources Inventory (LISRES; Moos, & Moos, 1994; $\alpha = .80$ in this sample). *Friends' support for abstinence* was measured at intake using eight items from the Social Network Social Influence Scale (Collins, Emont, & Zywiak, 1990). Patients indicated their anticipated housing structure at discharge from the treatment program. This was coded as a dichotomous variable representing *group housing* (i.e., halfway house or group home, or hospital inpatient program, or in a shelter or domiciliary, coded as 1) or *individual housing* (house or apartment, or rooming house in a hotel, or jail, or on the street, coded as 0).

Procedure

Participants were asked within 3 days of intake, to participate in a longitudinal study. A survey was administered by research staff at treatment intake, which assessed all the predictor variables described earlier (except *referral to self-help group* that was coded by research assistants, based on patients' medical charts). The survey was administered again at discharge (to assess housing), and by mail or telephone at 1 year after discharge (to assess self-help involvement).

RESULTS

Description of Self-Help Involvement

Most patients reported at least some level of involvement in 12-step self-help groups in the 3 months prior to the 1-year follow-up (see Table I). Fifty-six percent reported attending at least one meeting, with about 17%

Table I. Involvement in 12-Step Self-Help Groups at Follow Up

Number of 12-step meetings attended in past 3 months	
None (0)	44.0%
1–9 (1)	20.3%
10–19 (2)	11.8%
20–29 (3)	7.1%
30 or more (4)	16.8%
Mean	1.32 ($SD = 1.50$)
Frequency of seeing or talking with sponsor	
Never (0)	73.5%
Less than once a month (1)	2.6%
Once or twice a month (2)	4.2%
Once a week (3)	7.5%
Several times a week (4)	12.2%
Mean	.82 ($SD = 1.46$)
Frequency of seeing or talking with close friends in AA, CA, or NA	
Never (0)	46.7%
Less than once a month (1)	8.3%
Once or twice a month (2)	9.7%
Once a week (3)	10.4%
Several times a week (4)	25.0%
Mean	1.59 ($SD = 1.70$)
Frequency of reading the "Big Book," "24 Hours a Day," or other 12-step materials	
Never (0)	42.8%
Less than once a month (1)	15.8%
Once or twice a month (2)	11.8%
Once a week (3)	11.0%
Several times a week (4)	18.6%
Mean	1.47 ($SD = 1.56$)
Number of the 12 steps you have taken in the past 12 months	
None (0)	14.7%
1–3 (1)	20.6%
4–6 (2)	15.7%
7–9 (3)	16.8%
10–12 (4)	32.2%
Mean	2.31 ($SD = 1.47$)
Self-Help Group Involvement Scale	
Mean	7.30 ($SD = 6.01$)

Note: $n = 3,016$–$3,018$. Numbers in parentheses represent the value of the item on the Self-Help Involvement Scale.

attending 30 or more meetings per week. In addition, 58% of participants reported having read 12-step texts, with 20% reading them at least once a week; 53% had contact with friends who were members of 12-step groups; and 27% percent had contact with a sponsor, with 20% in contact at least once a week. Over 85% of patients reported incorporating at least 1 of the 12 steps into their daily life ($M = 5.7$; $SD = 4.46$), making it the most commonly reported aspect of self-help involvement; however, this is probably because these behaviors were reported for the past year, not just the prior

3 months. Levels of participation on each item were summed together to compute an overall self-help involvement scale (range = 0–20). Patients' average level of involvement on this scale was 7.41 ($SD = 6.00$).

Correlates of Self-Help Involvement

As an initial step in determining whether individual beliefs and characteristics, and aspects of the treatment and post-treatment social ecology predicted 12-step self-help group involvement, zero-order correlations were examined (see Table II). Because of the large sample size, the majority of correlations were statistically significant. Therefore, we focus our analysis on those correlations that met a more stringent cutoff ($p < .001$) and have practical implications.

Individual Beliefs and Characteristics

The strongest predictor of involvement in 12-step groups during the year after discharge was involvement in the year prior to intake ($r = .35$). Belief

Table II. Zero-Order Correlations Between Predictor Variables and Self-Help Involvement at Follow Up

Individual beliefs and characteristics	
Demographic variables	
Age	−.04
Years of education	.09***
Degree of employment	.02
Racial majority	−.14***
12-Step involvement prior to intake	.35***
Problem severity	
Alcohol dependence	−.02
Comorbid psychiatric diagnosis	−.05
Understanding/beliefs about substance abuse	
Disease model of alcoholism/addiction	.20***
Religious beliefs/behavior	.24***
Abstinence goal	.16***
Identity as an alcoholic or addict	.11***
Treatment social ecology	
Spirituality/religious treatment environment	.22***
Proportion of staff in recovery	.09***
Type of treatment program	.19***
Referral to self-help group	.16***
Post-treatment social ecology	
Availability of self-help meetings	.10***
Social support	.04
Friends' support for abstinence	.08***
Group housing	.12***

Note: $n = 2775$–3018.
*** $p < .001$; all tests two-tailed.

in the disease model of alcoholism ($r = .20$), religious beliefs and practices ($r = .24$), and abstinence goals ($r = .16$) were also moderately associated with involvement. By comparison, demographic characteristics and variables indicating problem severity were not strongly related to self-help involvement (all correlations less than .10), with one exception: non-Hispanic White patients were less involved than patients of other racial and ethnic backgrounds ($r = -.14$).

Treatment and Post-treatment Social Ecology

Variables assessing aspects of the treatment system beliefs and post-treatment social ecology were also predictive of involvement in 12-step groups. Spiritual/religious characteristics of the treatment environment ($r = .22$), 12-step/eclectic treatment programs ($r = .19$), and staff referral of patient to self-help ($r = .16$) were also positively correlated with involvement. The proportion of staff in recovery also predicted patients' involvement in self-help, although the association was relatively small ($r = .09$).

Housing structure at discharge predicted involvement ($r = .12$), indicating that patients discharged to group housing compared to individual housing were likely to be more involved in self-help. The availability of self-help meetings in the city also had a small but significant correlation with self-help involvement in the predicted direction ($r = .10$), indicating that patients receiving treatment in cities with more groups per square mile were likely to become more involved in self-help. Social support from friends and friends' support for abstinence had only weak positive relationships with self-help involvement ($r < .10$).

In order to address the possibility that the observed correlation between treatment environment and subsequent self-help involvement are due to patients' self-selection into treatment programs that included an emphasis on 12-step goals and activities, we tested the correlation between prior self-help involvement and type of treatment program. This correlation was significant ($r = .11$, $p < .001$), indicating that the relation between treatment program and subsequent self-help involvement can potentially be partly attributed to patients' involvement in self-help prior to treatment. This possibility was addressed more directly in the multivariate analyses reported later.

Hierarchical Linear Model Predicting Self-help Involvement

Because a large number of variables representing the individual and the treatment and post-treatment social ecology predicted self-help involvement,

we conducted a multivariate analysis in order to better understand their independent and combined association with 12-step involvement. For example, we were interested in whether self-help involvement at follow-up was merely a function of prior involvement or a combination of additional factors in the individual and treatment and post-treatment ecology. More specifically, we were interested in determining whether prediction based on individuals' demographic and clinical characteristics could be improved by also considering beliefs about and understandings of substance abuse, and whether prediction could also be improved by incorporating social ecological variables into the model. The correlation among the set of predictor variables was relatively low ($r_{\mathrm{M}}^2 = .09$; range $= .00$–$.66$) further indicating the appropriateness of a multivariate analysis.

The multilevel design of this study, in which patients were clustered within treatment programs precluded the use of a traditional regression to predict individual-level outcomes. Traditional linear regression on individual-level outcomes is based on an assumption that all cases are independent from one another. In this study, the individual reports of patients within the same treatment program are unlikely to be independent. For example, within a given program, patients received treatment from the same staff and were exposed to the same treatment environment. One solution is to collapse the data into group-averaged cases; however, this technique results in the loss of a great deal of useful information at the individual case level.

Instead, a hierarchical linear model (HLM; Bryk & Raudenbush, 1992) can be used to represent individual-level outcomes as a function of both individual- and group-level variables, while also estimating and adjusting standard errors for the degree of association among individuals within programs (Hedeker, McMahon, Jason, & Salina, 1994). In HLM, the degree of dependency between cases nested within a group is estimated and used to adjust parameter estimates and standard errors. Because of this adjustment, parameter standard errors in HLM are typically more conservative (i.e., larger) than those in traditional, non-hierarchical regression. Consequently, significance tests of these parameters, particularly those for group-level variables, will be more conservative.

A hierarchical linear model was fit for these data using the MIXREG program[3] (Hedeker & Gibbons, 1996; see Table III). Prior self-help involvement accounted for the most variance in self-help involvement at follow-up. However, consistent with theory regarding the importance of

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[3] As are many behavioral frequency distributions, overall self-help involvement was somewhat positively skewed (.595; $SD = .045$). The HLM was recomputed using a square-root transformation of self-help involvement, but the findings were not different than those from the original scale. For ease of interpretation, all analyses are reported using the untransformed scale.

Table III. Hierarchical Linear Model Coefficients Predicting Self-Help Group Involvement

Variables	B	SE	Z	Partial r
Individual beliefs and characteristics				
Demographic variables				
Age	.00	.01	−.51	.00
Years of education	.17	.06	2.88**	.05
Degree of employment	.25	.14	1.80	.03
Racial majority	−.39	.26	−1.52	−.02
Prior 12-step involvement	.37	.03	13.70**	.25
Problem severity				
Alcohol dependence	.00	.01	−.47	−.02
Comorbid psychiatric diagnosis	−.36	.27	−1.35	.01
Understanding/beliefs about substance abuse				
Disease model of alcoholism/addiction	.16	.03	5.32**	.09
Religious beliefs/behavior	.31	.05	6.86**	.12
Abstinence goal	.36	.10	3.51**	.07
Identity as an alcoholic/addict	−.24	.28	−.86	.02
Treatment Social Ecology				
Spirituality/religious treatment environment	.12	.22	.54	.03
Proportion of staff in recovery	−1.59	2.21	−.72	−.04
12-Step type of treatment program	1.55	.74	2.09*	.08
Referral to self-help group	.15	.32	.46	.02
Post-treatment social ecology				
Availability of self-help meetings	−.03	.06	−.50	−.04
Social support	.01	.02	.29	.02
Friends' support for abstinence	.02	.03	.90	.02
Group housing	1.28	.25	5.20**	.10
Intercept	−5.64	1.75	−3.22**	
Hierarchical clustering of patients in treatment programs	.67	.31	2.19	
Residual	28.24	.77	36.54**	

Note: p Values are two-tailed except for clustering and residual variances, which are one-tailed; $n = 2685$, Model $R^2 = .22$.
*$p < .05$. **$p < .01$.

person-environment fit that suggests belief compatibility as an explanation for self-help involvement, all the variables representing patients' understanding of and beliefs about substance abuse (with the exception of identity as an alcoholic or addict) also independently and significantly contributed to the prediction of self-help involvement. Specifically, belief in the disease model of addiction, abstinence as a treatment goal, and religious beliefs and practices independently predicted more self-help involvement. In addition, education also predicted greater involvement.

Consistent with the propositions of social ecological theory and its views of transitions between treatment environments, several aspects of the treatment and post-treatment social ecology also contributed to the prediction of self-help involvement. Group housing independently accounted for a statistically significant amount of additional variance in self-help involvement,

indicating that involvement was greater among those discharged into group housing as compared with individual housing. Type of treatment program also independently predicted self-help involvement, indicating that people who received treatment from 12-step or eclectic treatment programs were more involved in 12-step groups than those discharged from cognitive-behavioral programs.

As described earlier, the hierarchical linear model also provides an estimate of the proportion of variance in self-help involvement that is due to the grouping of patients within treatment programs but not accounted for by other covariates in the model. This *hierarchical clustering of patients in treatment programs* accounted for an additional 2% of the variance in self-help involvement, even after the inclusion of a number of other significant covariates in the model (intraclass correlation = .024). This finding indicates that some aspect of treatment environments not captured by the other treatment-level variables in the model is associated with additional variance in self-help involvement.

Altogether, the hierarchical linear model comprising these variables fit these data reasonably well, accounting for 22% of the variance in self-help involvement ($R^2 = .22$). Clearly, however, there are additional factors not contained in the model that contribute to self-help involvement.

Because regression coefficients are not intuitively meaningful, follow up analyses were conducted that more simply express the nature and magnitude of the relationships between statistically significant predictor variables and self-help involvement. The sample was divided at the median of each significant individual belief predictor variable into high and low groups, and then the mean difference in self-help involvement was computed between them. The difference in self-help involvement between groups high and low in education, $M_{diff} = 1.04$, $t(3015) = 4.76$, $p < .001$; belief in the disease model of alcoholism/addiction, $M_{diff} = 2.10$, $t(3016) = 9.68$, $p < .001$; religious beliefs and behavior, $M_{diff} = 2.40$; $t(3015) = 10.94$, $p < .001$; and abstinence goals, $M_{diff} = 1.81$; $t(3016) = 7.74$, $p < .001$, were all statistically significant. The magnitude of the effects of being discharged to group versus individual housing, $M_{diff} = 1.61$; $t(2773) = -6.34$, $p < .001$, and of receiving treatment in a 12-step or eclectic versus cognitive–behavioral type treatment program, $M_{diff} = 2.36$; $t(3016) = 10.69$, $p < .001$, on self-help involvement were similar. The practical effect of these mean differences cannot be expressed precisely because self-help involvement scores are the sum of several items measured on ordinal scales. However, translating the scores conservatively, a mean difference between groups of 1.5 units of self-help involvement corresponds approximately to a difference of attending 5–10 self-help meetings over 3 months, or having 2–3 meetings per month with

a sponsor or close friend active in a self-help group. Thus, each of these predictor variables is associated with an effect size that is both statistically significant and of practical importance in terms of the level of involvement in self-help groups.

Although not as substantively interesting, prior self-help involvement was the largest contributor to the prediction of self-help involvement at follow-up, which raises the concern that most of the predicted variance in self-help involvement at follow-up can be accounted for in terms of self-selection processes. That is, patients who have more prior self-help involvement may have selected treatment programs that emphasized a 12-step approach, or post-treatment environments conducive to self-help involvement. However, given that there was generally only one type of Veteran Affairs treatment program available in each metropolitan area sampled, patients did not have a wide variety of programs from which to select. In addition, results of the hierarchical linear model demonstrated that other variables contributed independently and significantly to the prediction of involvement at follow up, over and above the variance accounted for by prior self-help involvement. In order to determine the proportion of variance in self-help involvement accounted for by these additional variables, a reduced model in which prior involvement was the only predictor variable was fit to the data and compared to the full hierarchical model. The full model accounted for an additional 8% of the variance in self-help involvement over and above the reduced model, $R^2_{change} = .08$; $F_{change}(18, 2667) = 14.34$, $p < .001$, further indicating the importance of the additional variables in the full model. When viewed in terms of percentage of variance accounted for, this is a relatively small effect size. However, interpretations of R^2 often underestimate the practical significance of effects whose magnitude can be more readily appreciated in terms of binomial distributions (Rosenthal & Rubin, 1982). In this case, the correlation between the predictor variables and a median-dichotomized self-help involvement outcome ($r^2 = .08$) represents the difference between approximately 36 and 64% of the sample being above the median level of self-help involvement. In other words, variance in scores on variables other than prior self-help involvement represent a difference of 28% in the number of patients above the sample median level of self-help involvement.

DISCUSSION

In this study, the majority of patients who received inpatient treatment for substance abuse attended 12-step self-help groups after discharge, read

12-step literature, talked with friends or sponsors in the groups, and incorporated steps into their daily lives. Several individual characteristics and aspects of their belief systems made significant and independent contributions to the prediction of subsequent self-help involvement. People who at intake had more prior 12-step self-help group involvement, religious beliefs and behavior, belief in the disease model of addiction, education, and abstinence as a goal for treatment were more likely to be involved in 12-step groups 1 year later. This suggests that the compatibility between personal and treatment belief systems is an important factor in predicting involvement in self-help groups. In addition, aspects of the treatment and post-treatment social ecology independently predicted additional variance in self-help involvement. Patients who were discharged to group housing structures and in a 12-step or eclectic treatment program as opposed to a cognitive–behavioral program were more likely to be involved. Taken together, these findings confirm the importance of research on self-help groups that is based in a social–ecological framework (Maton, 1989, 1993).

Given initial demonstrations of the effectiveness of 12-step self-help groups in reducing substance abuse after treatment (Humphreys, Mankowski, Moos, & Finney, 1999; McKay et al., 1998; Ouimette, Moos, & Finney, 1998), these results have important implications for understanding substance abuse patients' transition between professional treatment and community-based self-help groups. More generally, the results further our understanding of which patients participate in 12-step self-help groups and what variables and contexts facilitate their involvement. Variables that assessed relevant aspects of individuals' personal belief systems predicted self-help involvement better than variables representing demographic characteristics, problem severity, or clinical diagnosis.

Compatibility of Individual and 12-Step Self-help Group Beliefs About Substance Abuse

This overall pattern of results suggests that compatibility of individuals' and self-help groups' belief systems about substance abuse is particularly conducive to future involvement in the group. In this respect, these data are consistent with narrative theory that views the self-help group as a community of shared beliefs, values, and norms that are exchanged through structured forms of storytelling in the group (Rappaport, 1993). Participation in the creation and elaboration of this shared narrative may in turn affect members' worldviews and understandings about their common experiences and individual identity, for example, as an alcoholic or addict (Humphreys, 1996; Kennedy & Humphreys, 1994; Mankowski & Rappaport, 1995).

Abstinence as a Goal

Compatibility of patient's reported treatment goals with those for 12-step self-help groups predicted greater attendance and involvement in 12-step groups at follow-up. McKay et al. (1998) found a nearly identical level of association between abstinence goals and subsequent 12-step attendance. Building upon these results, we found that relative to patients with no goals, or goals for "controlled" or "responsible" use, patients who have a personal goal of complete abstinence are more likely to participate in 12-step self-help groups. The 12-step view of addiction as a disease whose control requires complete abstinence is more consistent with this personal treatment goal. And, consistent with person–environment fit models of behavior (Pargament, 1986), patients setting goals for abstinence are likely to find the 12-step program environment more conducive to their own intentions.

Understanding of Substance Abuse as a Disease

Similarly, individuals' personal beliefs at intake appear to be related to their transition from professional treatment to self-help groups. Specifically, greater belief in the disease model of addiction predicted more involvement in 12-step self-help groups at follow-up. Because groups with a more psychosocial, cognitive–behavioral focus (e.g., SMART Recovery; see Bishop, 1996) are less available than groups such as AA, patients who view substance abuse more as a learned behavior over which one can exert personal control may be less likely to find a group compatible with their belief systems. The discrepancy between their understanding of substance abuse and 12-step self-help group ideology could discourage initial or continued involvement.

Religion and Spiritual Beliefs

Twelve-step groups are not religions, but they do have a strong spiritual component. In this research, patients with previous involvement in religious activities and with religious beliefs are more likely to participate in 12-step groups. This finding is also consistent with past research documenting a relationship between members' spirituality and group satisfaction in 12-step (but *not* other kinds) self-help groups (Maton, 1989). These findings make sense when seen from the perspective of patients' transition between professional and self-help environments. Those who have an established religious or spiritual history may be more likely to find the 12-step meetings and program familiar and comfortable.

Compatibility of Treatment and Post-treatment Social Ecology and 12-Step Self-Help Groups

Beyond the individual level, two additional and noteworthy findings of the study were that the type of inpatient treatment program and the type of housing in the post-treatment environment made significant differences in patients' levels of involvement in 12-step self-help groups during the year following discharge. These two social–ecological factors may represent important dimensions of the fit between individuals and self-help groups and affect patients' ability to smoothly transition between treatment environments and community-based self-help groups. For example, treatment environments that include support of 12-step values, beliefs, goals, and norms may provide a stepping stone between individual inpatient treatment and self-help, community-based support. If clinical staff want to enhance participation in AA, NA, or CA, they could orient their programs somewhat more toward 12-step principles, and focus more on reinforcing the disease model of addiction and on motivating patients to entertain an abstinence goal. Although we measured these latter two variables at intake, treatment presumably could enhance them and patients' status in these areas at discharge might be more strongly linked to participation. Twelve-step oriented treatment programs not only enhance patients' subsequent involvement in AA, NA, and CA, but also strengthen the link between participation and better substance abuse outcomes (Humphreys, Dearmin-Huebsch, Finney, & Moos, 1999).

The finding that patients discharged to group housing are more likely to be involved in self-help suggests that group housing may provide another transitional stepping stone to community-based self-help. An important function of this stepping stone may be that it provides greater or easier access to self-help groups. The positive correlation between the geographic density of 12-step self-help groups and involvement is consistent with this idea that accessibility is related to involvement. Group housing, such as halfway homes and homeless shelters, may be more likely than individual housing to host self-help group meetings and to be nearby other meeting locations, public transportation, and child care facilities. In addition, treatment professionals who can encourage participation in self-help groups, are often present in group housing for people with substance abuse problems. These features of group housing may facilitate meeting attendance and provide greater access to supportive sponsors and other group members outside meetings.

Patients receiving treatment from a program focused almost exclusively on cognitive–behavioral goals and activities are less likely to be involved in a self-help group following discharge. This finding speaks most powerfully to the idea that the compatibility between the beliefs, values, and norms of a

treatment environment and self-help groups can have a significant impact on the involvement of patients in self-help. Cognitive–behavioral goals and activities were *negatively* related to subsequent self-help involvement. It would be interesting to know whether 12-step goals in the treatment environment were negatively related to patients' involvement in cognitive–behavioral aftercare groups in the community. This information should be considered by those who design treatment programs, given the positive effects of involvement in 12-step groups on substance abuse outcomes (Ouimette et al., 1998) and friendship networks (Humphreys & Noke, 1997).

Considered as a set, individual-level variables are good predictors of involvement in 12-step groups, particularly those variables that assess dimensions that are characteristic of 12-step group beliefs and norms (e.g., belief in a disease model of alcoholism and drug addiction). However, measures of the treatment and post-treatment social ecology were also predictive of subsequent involvement in self-help groups. These findings show that assessing variables representing the social ecology of potential self-help group members, particularly those that illustrate the degree to which the person's goals and belief systems fit those in the self-help group environment, enables improved prediction of self-help group participation.

Self-Help Involvement and Demographic Characteristics

Consistent with some prior research (e.g., Humphreys & Woods, 1993), our correlational results indicate that non-Hispanic whites were slightly *less* involved, in 12-step self-help groups after treatment than members of other ethnic and racial groups. The reasons for this difference cannot be inferred from these data, but if the logic we have used throughout this paper to explain self-help participation is applied to this finding, it suggests that 12-step self-help groups are at least as compatible with the belief systems of ethnic minorities as with non-Hispanic whites. More specifically, self-help groups probably reflect the social climate and ecology of the locale or region in which they meet. For example, African Americans participate in 12-step self-help groups more when they are the racial majority in a geographic area (Humphreys & Woods, 1993). To evaluate this possibility in the present data, we performed a supplemental analysis to determine whether self-help involvement was higher among those individuals who were in the racial majority within their treatment program or city population, but the correlation was nonsignificant. Further studies are needed that analyze self-help involvement among diverse populations of ethnic and racial groups in order to determine whether underlying assumptions and values of self-help groups and the self-help movement are compatible

with the beliefs, interests, and empowerment of disenfranchised groups in society.

Conclusions and Implications

Some limitations of the study point to directions future work might take in this area. First, studies need to sample the broader range of self-help groups and participants. There are many types of self-help groups for substance abuse other than 12-step groups (Kessler, Mickelson, & Zhao, 1997). In addition, although males comprise the majority of participants in self-help groups for substance abuse, the majority of participants in other types of groups are women (Gottlieb & Peters, 1991). The specific predictors of involvement among these populations and groups may differ.

Second, data on involvement in self-help groups need to be collected from multiple sources. In addition to retrospective self-reports, studies should more frequently attempt to assess involvement directly, such as weekly reports of attendance (see McLellan, Alterman, Cacciola, Metzger, & O'Brien, 1992), or reports collected from group records. However, although more direct methods for assessing individuals' participation might increase the reliability of the data, it could also affect group members' participation. Researchers need to carefully consider the ethical issues and reactive consequences that may arise when directly observing self-help group meetings.

Based on the data we collected, we were able to find that the compatibility of individual, treatment program, and 12-step group beliefs and values regarding substance abuse predict greater involvement. Efforts aimed at increasing 12-step self-help group involvement should consider ways of more closely linking inpatient treatment and community-based self-help environments. In particular, increasing the extent to which treatment programs are based on goals and activities consistent with 12-step self-help groups and strengthening the tie between group housing and self-help meetings are two directions these findings suggest are worthy of consideration.

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