

DO ENHANCED FRIENDSHIP NETWORKS AND ACTIVE COPING MEDIATE THE EFFECT OF SELF-HELP GROUPS ON SUBSTANCE ABUSE?^{1,2,3}

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ABSTRACT

Self-help groups are the most commonly sought source of help for substance abuse problems, but few studies have evaluated the mechanisms through which they exert their effects on members. The present project evaluates mediators of the effects of self-help groups in a sample of 2,337 male veterans who were treated for substance abuse. The majority of participants became involved in self-help groups after inpatient treatment, and this involvement predicted reduced substance use at 1-year follow-up. Both enhanced friendship networks and increased active coping responses appeared to mediate these effects. Implications for self-help groups and professional treatments are discussed.

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INTRODUCTION

Substance abuse is a prevalent and chronic behavioral health problem that increases risk for a variety of other serious medical conditions (1,2). Due to the human suffering and attendant costs attributable to substance abuse, a significant amount of scientific attention has been directed towards developing and evaluating professional substance abuse treatments (e.g. methadone maintenance, psychotherapy). Far less attention has been directed towards understanding how peer-led self-help groups can assist in the resolution of drug and alcohol problems. Hence, in keeping with this Special Issue's theme of innovation in promoting health behavior change, the present study is among the first to evaluate the mechanisms by which self-help groups may affect the course of substance abuse problems. Because few articles on self-help groups have appeared in behavioral medicine journals, we begin by providing some background on the prevalence and nature of these groups. Following the conventions of the literature, we use the terms "self-help group" and "mutual help group" interchangeably throughout the article.

Even though the United States has an extensive network of professional substance abuse treatment services, mutual help groups are the most commonly sought source of help for substance abuse problems (3). Recent national surveys have estimated that between 6.4%–12.0% of American adults attend such groups at some point in their lives (4,5). Most of this participation occurs in 12-step mutual help groups such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA), with the remainder being in smaller organizations such as Women for Sobriety, SMART Recovery, and Secular Organization for Sobriety.

Although there are many different substance abuse-related mutual help organizations, all share several features. First, they have regular meetings in which individuals with a common substance abuse problem congregate and attempt to support each other through the process of problem resolution. Second, all members are considered peers and are expected to both give and receive help. This mutual helping occurs both during and outside of group meetings. For example, members sometimes form friendships with each other or participate in group-sponsored social events (e.g. "sober" dances). Third, participation is free of charge, save for small, voluntary "pass-the-hat" contributions. Fourth, self-help groups offer a philosophy of change, such as the 12 steps used in AA and NA. This philosophy typically is recorded in printed literature (e.g. pamphlets) and offers strategies for self-examination, coping with life stresses, improving relationships, and overcoming substance abuse.

The scientific literature on the effectiveness of AA is modest in size, but has grown significantly in the past few years. A recent meta-analysis indicated that greater AA participation correlates with reductions in problem drinking and increases in psychosocial functioning (6). Very few studies have been undertaken of the effectiveness of Cocaine Anonymous (CA) or NA, but those that have are consistent with the hypothesis that attendance at these groups reduces substance abuse (7–9). Although these results are encouraging, they only address whether or not these groups are effective, not how they exert their effects. Finney (10) has argued that evaluations of interventions for substance abusing individuals are more informative when they examine mediational processes as well as overall effectiveness. Mediators are variables assumed to be implicated in the causal process of change. For example, if AA participation leads to improved coping with anxiety, this proximal outcome may, in turn, lead to reduced alcohol consumption.

We have proposed a conceptual framework for evaluating self-help groups which draws heavily from stress and coping theories (see Humphreys, Finney, and Moos [11] for a detailed description). Based on this model, we hypothesize that the substance abuse outcomes of self-help participation may be mediated by changes in friendship networks. Like all social organizations, self-help groups bring individuals in contact with other people who may become integrated into friendship networks. For example, in a previous study we found that new self-help group members frequently replaced substance abusing friends with

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friends who were involved in self-help groups (12). Self-help groups may also alter the quality of friendships by focusing substantial attention on ways to improve relationships with others. For example, AA, CA, and NA ask members to make restitution to friends and family for past wrongs, and there is a powerful social norm within these self-help groups for members to be honest with and supportive of others (13).

Our conceptual evaluation model also hypothesizes that self-help groups may affect coping responses, which seem another likely mediator of changes in substance use. AA, CA, and NA explicitly teach active cognitive and behavioral coping responses. For example, group slogans (e.g. "Take it one day at a time," "Keep it simple") remind members to use cognitive methods to manage stressors such as unpleasant emotions and urges to consume substances. These groups' emphasis on taking responsibility for controllable events (versus uncontrollable ones) may also foster active behavioral coping. Finally, mutual help groups may increase active coping indirectly by discouraging the substance use that members engaged in previously to avoid problems.

To our knowledge, only a handful of studies have provided information relevant to these mediational hypotheses. Snow and colleagues (14) conducted a cross-sectional study of 191 currently abstinent individuals who had a history of alcohol problems. Active AA members more commonly used helping relationships and behavioral coping strategies (e.g. rewarding oneself for abstinence, seeking out places where others were not drinking) to maintain abstinence than did former AA members and individuals who had never attended AA. Humphreys et al. (11) found a similar result in a prospective study of 439 service recipients from alcohol informational and referral centers and detoxification units. Over a 3-year period, alcohol-abusing individuals who attended more AA meetings relied more on active behavioral and cognitive coping responses and experienced increased quality of relationships with friends.

Morgenstern et al. (15) went a step further by demonstrating that the increased active coping responses associated with AA participation mediated subsequent reductions in alcohol consumption. However, Morgenstern did not examine the potential role of friendship network changes as another mediator. Both Humphreys et al.'s and Snow et al.'s findings indicate that AA may enhance friendship networks, and other work (16) suggests that fellowship with others and social support are the primary reasons why substance dependent individuals choose to attend self-help groups.

In an earlier study using the sample employed here (12), we found that posttreatment participation in AA, NA, and CA predicted two types of changes in friendship networks. Specifically, mutual help group involvement increased general friendship quality (e.g. number of close friends, level of trust and respect with friends) and friends' support for abstinence (e.g. whether friends use drugs or alcohol or hinder/help efforts to abstain). That study did not examine coping responses or substance abuse behavior. The present study builds on this initial project, as well as on other work on potential mediators just described.

The key question addressed by the present study is whether alterations in coping responses and friendship networks are the mechanisms through which mutual help group participation influences substance use. If self-help groups can increase members' active coping responses, this should provide an alternative to using substances as a means to cope with life stressors. Enhanced friendship networks also are a plausible mediator of change because quality friendships should help buffer life stressors and support decreased alcohol and drug consumption.

METHODS

Participants

The present sample is composed of 2,867 male veterans who were seeking substance abuse treatment at one of 15 Veterans Affairs (VA) inpatient programs. These individuals were a subset of a sample of 3,698 patients participating in a nationwide, prospective study of substance abuse treatment effectiveness (17,18). In the larger study, 88% of those asked to participate ($n = 4,192$) consented. Other than female sex ($n = 64$ patients), there were no exclusion criteria in the larger study. For the present analysis, patients who were already involved in self-help groups at or prior to treatment intake ($n = 831$) were excluded in order to strengthen the basis for causal inference about the effects of joining a self-help group after an inpatient episode of substance abuse treatment.

One year after discharge, 81.5% of the 2,867 participants were successfully followed. Primarily, these 2,337 individuals were African-American (49.0%) or non-Hispanic Caucasian (45.2%). At intake, most were unemployed (76.1%) and not currently married (81.8%). Average age was 42.9 years ($SD = 9.6$). According to participants' medical charts, the most common *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III-R) (19) Axis I clinical diagnoses in the sample were alcohol dependence (61.1%) and cocaine dependence (25.5%).

Procedure

Recruitment occurred within 3 days of treatment intake. After explaining the evaluation project to participants, project staff asked participants to complete a baseline inventory. The evaluation team member contacted participants again 1 year after discharge and re-administered the inventory by mail or, less frequently, by telephone.

Measures

Frequency of substance abuse in the past 3 months was measured for each substance using 5 response options (0 = Never, 1 = Less than once a week, 2 = 1–3 days a week, 3 = 4–6 days a week, 4 = every day). In the case of substances that might be consumed through multiple routes of administration (e.g. both injected and smoked), each route was addressed by a separate item. Narcotic use was defined as the sum of responses to frequency items for heroin (injected or snorted) and other opiate use (e.g. street methadone, morphine). Stimulant use was defined as the sum of responses to frequency items for cocaine (injected, snorted, or smoked), amphetamine, and methamphetamine use. Hazardous alcohol use was defined as the frequency of consuming more than two ounces of ethanol on a drinking day in beer, wine, or hard liquor. This definition was used so that problem drinking would be distinguished from moderate alcohol consumption within safe limits (i.e. typically consuming no more than four beers, or glasses of wine, or shots of hard liquor on drinking days). A subset of participants received an alcohol and/or drug test (e.g. urine, blood, or breath sample) during nonrandom patient visits to VA facilities (e.g. medical appointments). Self-reports of abstinence were significantly associated with negative alcohol or drug tests (all $ps < .001$). Of the 37 patients who self-reported abstinence from alcohol and were tested, 35 had a negative biological test for alcohol use. Of the 167 patients who self-reported abstinence from drugs and were tested, 144 had a negative test for drug abuse.

Active Coping Responses: Cognitive and behavioral approach coping responses were assessed using scales from the Coping

Responses Inventory (CRI) (20). The CRI asks respondents to report how much they used a variety of potential coping responses to deal with the most stressful event they had experienced in the past year. Two CRI scales were used here because they tap coping dimensions shown to change during self-help group involvement in a previous prospective study (11). Behavioral problem-solving was assessed by a 6-item scale ($\alpha = .79$) tapping behavioral efforts to deal with the problem actively (e.g. developing a plan of action and following it). Positive reappraisal was measured using a 6-item scale ($\alpha = .76$) tapping cognitive efforts to address the problem and associated emotions (e.g. looking at what benefits might come out of the stressful situation).

General Friendship Quality: Participants reported on their number of close friends and on their frequency of contact with them (response options ranged from “never” to “several times a week”). The 6-item friendship resources scale ($\alpha = .80$) from the Life Stressors and Social Resources Inventory (21) was used to measure trust, respect, and support in friendships. Sample items from the friendship resources scale included, “Do your friends cheer you up when you are sad or worried?” and “Do you share mutual interests or activities with your friends?”

Friends’ Support for Abstinence: A 4-item scale ($\alpha = .74$) was adapted from the Social Network Social Influence Scale (22) to measure friend’s support of recovery efforts (e.g. friends offer advice and support about quitting without nagging). Abstinence by friends was assessed using dichotomous variables for alcohol and for other drugs (0 = Most friends use, 1 = Most friends do not use).

Posttreatment Involvement in AA/CA/NA: Involvement in Alcoholics Anonymous, Cocaine Anonymous, and Narcotics Anonymous after discharge was assessed with three items: Number of group meetings attended in the 3 months prior to follow-up; frequency of reading books and pamphlets distributed by AA/NA/CA; and the number of the 12 steps that participants had tried to incorporate into their daily lives since discharge from inpatient treatment.

RESULTS

Attrition Analysis

Before pursuing the primary questions of the study, it was necessary to evaluate potential effects of follow-up attrition. Those patients who had been successfully followed ($n = 2,337$) were compared to those who were lost to follow-up ($n = 531$) on demographic indicators and every key baseline variable. These 18 comparisons showed no statistically significant differences between groups on race, marital status, age, education, religious affiliation, or any of the substance use, coping, and friendship-related variables employed in the study.

Descriptive Analysis

Because of the large sample size, even practically insignificant changes over time in individual variables were statistically significant. Hence, we present such data descriptively (see Table 1), reserving statistical significance testing for the multivariate models that will be estimated. Respondents engaged in extensive substance abuse in the 3 months prior to treatment intake. Narcotics (primarily smoked/inhaled heroin) were used by a small but significant proportion (13.0%) of participants at intake. Stimulant use was far more common (50.8% of participants). The most commonly used stimulant at baseline was crack cocaine (44.1% of

TABLE 1
Baseline and 1-Year Follow-Up Data on 2,337 VA Substance Abuse Inpatients’ Substance Use, Friendship Networks, and Coping Responses

	Intake %	Follow-Up %
Substance Abuse		
Narcotic use	13.0	6.3
Stimulant use	50.8	24.6
Hazardous alcohol consumption	87.7	40.3
Friendship Networks		
Four or more close friends	21.2	25.8
Contact with friends once/week or more	45.2	55.9
Most friends use alcohol (% Yes)	75.0	57.8
Most friends use drugs (% Yes)	44.8	30.1
	Mean (SD)	Mean (SD)
Friendship resources	13.0 (5.7)	14.0 (5.9)
Friends’ support of recovery efforts	11.8 (3.4)	12.1 (3.4)
Coping Responses		
Behavioral problem-solving	10.3 (4.5)	12.2 (4.4)
Positive reappraisal	10.0 (4.3)	11.2 (4.4)

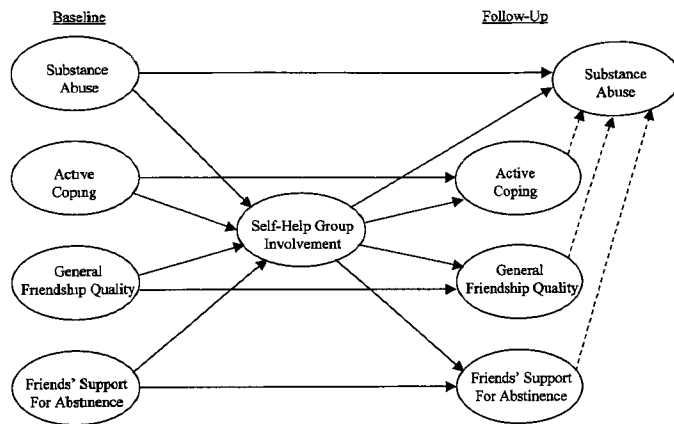
participants), which the modal users smoked 1–3 times a week. Hazardous alcohol consumption (87.7% of participants) was primarily in the form of beer and hard liquor. For beer, “every day” was the most commonly reported (42.4%) frequency of drinking among those doing so in a hazardous fashion. For hard liquor, “less than once a week” (29.4%), “1–3 times a week” (27.8%), and “every day” (26.5%) were the most commonly reported frequencies of hazardous consumption. At 1-year follow-up, there were substantial declines in the proportion of respondents using narcotics (6.3%) and stimulants (24.6%) and consuming alcohol in a hazardous fashion (40.3%).

Respondents also experienced increases in the size of and frequency of contact within their friendship networks. More dramatic changes were noted for friends’ drug and alcohol use, which decreased substantially (75.0% to 57.8% for alcohol and 44.8% to 30.1% for drugs). In terms of friendship quality, modest improvements can be seen in friendship resources (13.0 at baseline versus 14.0 at follow-up) and friends’ support of recovery efforts (11.8 at baseline versus 12.1 at follow-up). Finally, active coping responses increased on both the behavioral problem-solving (10.3 at baseline, 12.2 at follow-up) and positive reappraisal (10.0 at baseline, 11.2 at follow-up) dimensions.

Participants became heavily involved in mutual help groups after treatment. Specifically, in the 3 months prior to follow-up, 51.1% ($n = 1,194$) reported going to at least one AA/CA/NA meeting, with 17.3% ($n = 404$) going to 20 or more meetings. A total of 52.4% ($n = 1,225$) reported reading AA/CA/NA literature, with 25.6% ($n = 598$) doing so at least weekly. In the year from discharge to follow-up, 76.5% ($n = 1,788$) of participants reported attempting to incorporate at least 1 of the 12 steps into daily life, with the average participant reporting trying to incorporate 7 steps ($SD = 3.8$ steps). Overall, 84.4% ($n = 1,972$) of participants reported engaging in at least one of these activities after treatment, and 57.7% ($n = 1,349$) of participants reported engaging in two or more.

Mediational Analysis

Figure 1 presents direct effects and mediational models drawn from our stress and coping evaluation framework (11). Key constructs in the model are enclosed in circles, and hypothesized



Note: Dotted pathways are estimated in the mediational model only

FIGURE 1: Direct effects and mediational models of interrelationships of self-help group involvement, substance abuse, active coping, and friendship networks in a sample of 2,337 substance abuse patients.

causal pathways are indicated by arrows. The dotted pathways are the only difference between the direct effects and mediational models (i.e. they are estimated in the mediational model only). In order to demonstrate a mediational effect, it is first necessary to determine whether the independent variable (in this case, mutual help group involvement) predicts the hypothesized mediators (in this case, friendship network characteristics and coping) and the ultimate outcome (in this case, substance abuse) (10). These relationships are presented in Figure 1, which hypothesizes that mutual help group participation directly affects substance abuse, active coping, and the two friendship network variables.

In the mediational model, the dotted pathways are also estimated to reflect the hypothesis that the effect of mutual help groups on substance abuse (presuming one is identified in the direct effects model) is mediated through changes in friendship networks and coping responses. In modeling terms, this involves specifying three new parameters at follow-up representing hypothesized causal pathways from active coping, general friendship quality, and friends' support for abstinence to substance abuse. The path between self-help group involvement and substance use is still estimated in the mediational model because its strength, relative to that in the direct effects model, will determine whether a mediated effect has been supported. If the beta weights for this path are similar in the mediational and direct effects models, then mediation is not supported for the hypothesized variables (i.e. coping and friendship network changes are not implicated in the causal chain between self-help group involvement and substance abuse). For the results to be consistent with the mediational model, the coefficient for the path from self-help group involvement to substance abuse must be smaller in the mediational model than in the direct effects model.

Both the direct effects and mediational models were tested using structural equation modelling with the LISREL VII software program (23). This approach involves specifying latent variables that represent key underlying constructs. These latent variables are enclosed in circles in Figure 1. Each latent variable is determined by manifest variables that are directly observed and measured (i.e. those described in the methods section). The manifest variables indicating each latent variable in the models are presented in Table 2. Paths between manifest and latent variables measured more than

TABLE 2 Standardized Weights for Direct and Mediational Structural Equation Models

	Direct Model	Mediational Model
Substance Abuse (LV)	.39	.26
Narcotic use (OV)	.20	.20
Hazardous alcohol use (OV)	.30	.30
Stimulant use (OV)	.39	.38
Active Coping Responses (LV)	.34	.33
Behavioral problem-solving (OV)	.90	.90
Positive reappraisal (OV)	.66	.67
General Friendship Quality (LV)	.44	.44
Number of close friends (OV)	.69	.69
Frequency of contact with friends (OV)	.71	.71
Friendship resources (OV)	.73	.72
Friends' Support for Abstinence (LV)	.32	.31
Friends' support of recovery efforts (OV)	.09	.09
Friends' abstinence from alcohol (OV)	.53	.53
Friends' abstinence from drugs (OV)	.82	.82
Twelve-Step Group Involvement (LV)	NE	NE
Meeting attendance (OV)	.77	.77
Reading literature (OV)	.84	.84
Incorporating the 12 steps (OV)	.47	.47

Notes: (LV) = Latent variable; (OV) = Observed variable; NE = Path not estimated.

For observed variables, weights refer to the paths connecting observed variables to their latent variables at baseline and follow-up. For latent variables, weights refer to paths connecting the latent variable at baseline to the same latent variable at follow-up.

once were constrained to be equal across waves (e.g. the path from the substance abuse latent variable to the narcotic use observed variable) (24).

As recommended by Jöreskog and Sörbom (23), LISREL analysis was conducted using the polychoric correlation matrix, because both ordinal and continuous variables were employed. All manifest variables were modeled to predict themselves at subsequent time points. This correction for the correlation in measurement error resulting from repeated measurement (autocorrelation) improves overall fit and reduces bias in parameter estimates (25).

Because fitting any model may generate nonsubstantive chance results peculiar to a single data set, Jöreskog and Sörbom (23) recommend that LISREL models be cross-validated on separate samples. Hence, in order to assess the fit of the direct effects and mediational models, each was fit on a randomly selected half of the data set. Paths that were not statistically significant in the first half of the data were deleted (23), and then the trimmed version of the model was fit on the other half of the data. For both models, three parameters were not significant in the first half of the data. These were the paths connecting baseline general friendship characteristics to posttreatment self-help group involvement and the hypothesized correlations of active coping with substance abuse and general friendship network characteristics at baseline. All other specified parameters were statistically significant ($|T| > 1.96, p < .05$) and hence were carried forward to the second randomly selected half of the data. With these three paths deleted, both the direct effects and mediational models fit the second half of the data well, with all paths being significant ($p < .05$). Final path estimates and fit statistics were then calculated for each model on the whole sample.

Figure 2 presents results for the direct effects model, which had adequate fit to the data in the full sample (Goodness of fit

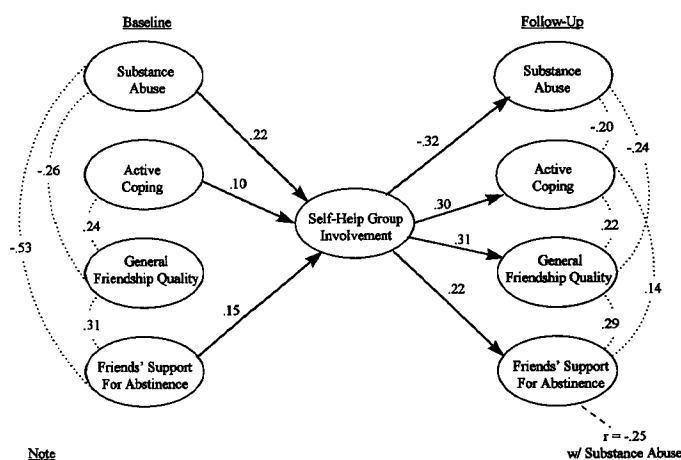


FIGURE 2: Structural equation model showing direct effect of self-help group involvement on substance abuse, active coping, general friendship quality, and friends' support for abstinence.

index = .950). The parameters for the paths linking the latent variables to their observed variables (e.g. the path from the substance abuse latent variable to the narcotic use observed variable had a weight of .20 in the direct effects model) and the paths connecting latent variables to themselves at subsequent waves (e.g. the path from substance abuse at time baseline to substance abuse at follow-up had a weight of .39) are reported in Table 2. The coefficients for the paths connecting different latent variables are of more substantive interest and are presented in Figure 2 along with the correlations between variables within-wave (small dotted lines). The baseline predictors were moderately related to posttreatment mutual help group involvement. Specifically, greater substance abuse, active coping responses, and friends' support for abstinence at baseline predicted more posttreatment self-help group involvement. Although these paths were statistically significant, they were substantially smaller than the paths between self-help group involvement and outcomes. Greater mutual help group involvement after inpatient treatment was associated with less substance abuse (Beta = $-.32$), more active coping responses (Beta = $.30$), higher general friendship quality (Beta = $.31$), and greater support for abstinence by friends (Beta = $.22$) at follow-up. These results indicate that analysis of mediational effects is appropriate because self-help group involvement predicted both the hypothesized mediators (friendship network and coping variables) and the ultimate outcome (substance abuse).

Because the substantive meaning of a beta weight in a structural equation model is not necessarily clear intuitively, supplemental univariate analyses were done to produce clinically meaningful and easily comprehensible data on the size of the effect of self-help group involvement on substance abuse. Abstinence rates for cocaine and alcohol were compared for individuals who attended 10 or more self-help group meetings versus those attending 0–9 meetings. In the 3 months prior to follow-up, 28% of individuals attending few or no meetings used cocaine and 68% used alcohol, versus only 15% and 35%, respectively, of those individuals attending 10 or more meetings. Hence, in practical terms, the effect identified was substantial.

The mediational model had adequate fit in the full sample (Goodness of fit index = .949). The parameters for the paths

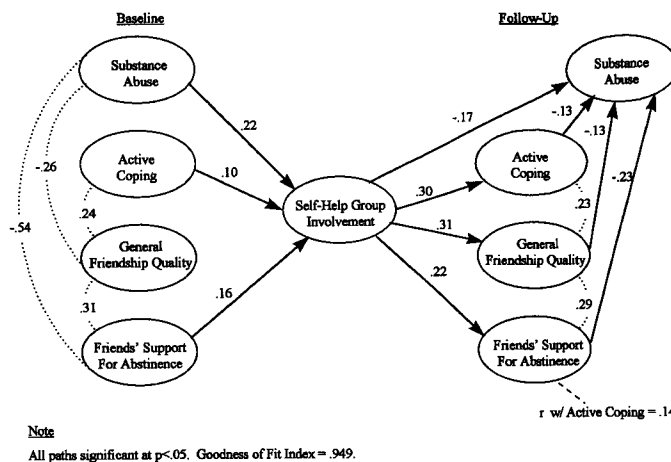


FIGURE 3: Structural equation model showing that effect of self-help group involvement on substance abuse is mediated through active coping, general friendship quality, and friends' support for abstinence.

connecting the latent variables with the manifest variables and the latent variables to themselves at subsequent waves are presented in Table 2. Figure 3 displays the parameters for the paths connecting the latent variables, which are of more substantive interest. All three hypothesized mediators show significant relationships in the expected direction with substance abuse. The strength of the direct relationship between self-help group involvement and substance abuse decreases substantially when the mediational links are specified (the beta coefficient drops from $-.32$ in the direct effects model to $-.17$ in the mediational model). There is no accepted standard or direct statistical test for assessing how much of a reduction in the strength of a direct causal pathway should be considered evidence of partial mediation. However, given that the mediators reduce the direct effect by almost half, we can say at a minimum that these results are consistent with (though are not conclusive proof of) the hypothesis that part of the effect of AA/CA/NA involvement on substance abuse is due to increases in active coping, general friendship quality, and friends' support for abstinence, which in turn predict reduced substance abuse. However, even when these mediators are considered, self-help group involvement continues to have a direct effect on substance abuse (i.e. the beta weight remains nonzero), indicating that the results are consistent with partial rather than full mediation.

DISCUSSION

This study supported the effectiveness of posttreatment mutual help groups in a nationwide sample of 2,337 substance abuse patients. Self-help group involvement independently explained 5%–10% of the variance in important outcomes, controlling for the baseline value of those outcomes. Participation in AA/CA/NA was associated with increases in active coping responses, general friendship quality, and friends' support for abstinence at 1-year follow-up. All three of these outcomes are important in themselves. In addition, these outcomes partially mediated the relationship between mutual help group participation and substance use behavior. Specifically, the results were consistent with our a priori hypothesis that two of the mechanisms through which self-help groups reduce drug and alcohol consumption are by improving intermediate friendship network and coping factors.

The changes observed in the friendship networks of self-help group members are of two types. Group participation was associ-

ated with improved general friendship quality, meaning those positive aspects of friendships that are not specific to substance abuse. In addition, group participation predicted changes in substance abuse-specific features of friendships, such as whether friends supported recovery efforts and used drugs and alcohol themselves. Beattie and Longabaugh (26) have argued cogently that while general friendship quality may be more important for overall well-being, substance abuse-specific features of social relationships (e.g. friends' support for abstinence) are better predictors of future substance use behavior. The present analysis bears this point out: Friends' support for abstinence was a substantially more powerful mediator of the relationship between mutual help group participation and substance use than was general friendship quality.

The power of friends' support for abstinence as a mediator can be explained in behavioral terms. If an individual's friends do not use substances, stimuli to use are removed from the social environment and positive social activities that do not involve substance use will be more available. Further, while "drinking buddies" presumably reward substance abuse with social approval, friends who support abstinence efforts provide social approval and encouragement for not using alcohol and drugs. Of course, staff in inpatient treatment programs also provide a substance-free environment and social approval for abstinence but have the opportunity to do so for a much shorter period (e.g. 21–28 days) than do a group of close friends. Hence, self-help group involvement may involve salubrious social network mechanisms similar to those employed in treatment, but offer them for a more extended period that makes continued abstinence more likely.

Turning to the results for coping, once active coping skills are internalized, members have more effective methods available to deal with life stressors. As individuals cope with stressors more effectively, distress is reduced and active coping (rather than substance use) is rewarded. Although the data here do not directly address this issue, we would speculate that over time, positive cycles may develop for self-help group members, such that active coping, abstinence, enriched social networks, and reduced life stressors continually reinforce each other, just as avoidant coping, substance abuse, conflicted relationships, and increased life stressors may have formed a self-reinforcing negative system prior to treatment and self-help group involvement.

The finding that self-help group involvement was associated with increased active coping responses and enhanced friendship networks has relevance to professional treatment as well as mutual help groups. One of the key benefits of mediational analyses is that they help specify the processes through which important health outcomes may be generated across intervention settings. Even though the project here examined mutual help group participation, one would expect that professionally-operated interventions that enhance active coping responses and friendship networks should also reduce patients' substance use.

At the same time, increases in active coping and enhanced friendship networks were only partial mediators, explaining slightly more than half of the effect of mutual help group participation on substance abuse. Hence, other mediators not examined here may be implicated in the change process. AA, CA, and NA put significant emphasis on spiritual change, which may be another mediator of reductions in substance abuse (though one perhaps unusually difficult to capture with traditional social science measurement approaches). Another group of potentially important factors are self-efficacy, morale, and motivation (15). As individuals become integrated into mutual help groups, they are exposed to

role models (e.g. successfully recovering former addicts) and taught coping strategies that increase their belief that the future holds attainable rewards. This, in turn, should encourage more participation and more motivation/self-efficacy in a cyclical process. These processes, as well as spiritual change processes, are important areas to examine in future studies of the mediators of mutual help groups' effectiveness.

Several potential limitations of this study deserve comment. First, the absence of women from the sample limits generalizability, because there may be significant sex differences in how social relationships and substance use interact (27). Second, because individuals were not randomly assigned to attend self-help groups, one could argue that the apparently positive outcome results are due to self-selection of the best prognosis cases into self-help groups. Two potentially positive baseline prognostic signs—active coping and friends' support for abstinence—were modestly related (1%–2% of variance in participation independently explained) to greater self-help group involvement after treatment. However, greater frequency of substance abuse, which is a negative prognostic sign, was a better predictor of subsequent self-help group involvement (independently explaining about 5% of the variance). Hence, on balance, it does not appear that positive self-selection on the baseline variables produced the pattern of outcome results identified.

A final potential concern is the partial overlap between the time window in which self-help group involvement was assessed with the time window for the hypothesized mediators and ultimate outcomes and the complete overlap between the time windows for the mediators and outcomes. Hence, one could use the present data to argue for a different mediational process interpretation; for example, that substance abuse behavior mediates the effect of self-help groups on coping responses rather than the other way around. This potential shortcoming cannot fully be addressed until we have completed the 2-year follow-up wave. However, we would emphasize that the model tested was a priori (being formulated and published before the present study began [11]), and that in other prospective work we have found that self-help group involvement predicts future changes in social resources and coping (11,28).

Given that individuals with substance abuse problems are more likely to seek help from mutual help groups than from professional treatment providers (3), greater attention should be given to evaluating how these organizations work. The present study is the first to provide initial evidence that both social network and coping variables mediate the relationship between mutual help group participation and substance abuse. However, additional mediators not examined here also appear to be involved. We hope that other evaluators will pursue this line of research further, because mutual help groups are an important resource for behavioral medicine practitioners intervening with individuals who have substance abuse and other behavioral disorders.

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