

# Predictors of Initial AA-Related Helping: Findings From Project MATCH\*

MARIA E. PAGANO, PH.D.,<sup>†</sup> SARAH E. ZEMORE, PH.D.,<sup>†</sup> CASEY C. ONDER, B.A., AND ROBERT L. STOUT, PH.D.<sup>†</sup>

*Department of Psychiatry, Division of Child Psychiatry, School of Medicine, Case Western Reserve University, 11100 Euclid Avenue, Cleveland, Ohio 44106*

**ABSTRACT. Objective:** The purpose of this article is to identify the factors that predict initial Alcoholics Anonymous (AA)-related helping following treatment admission. **Method:** Data were derived from Project MATCH (Matching Alcoholism Treatments to Client Heterogeneity), a longitudinal investigation of the efficacy of three behavioral treatments for alcohol abuse and dependence. Cox proportional hazard regressions were performed to determine the extent to which demographic, clinical, belief, and AA factors predicted initial AA-related helping. **Results:** Demographic characteristics, drinking severity, antisocial personality, and purpose in life were not associated with initial AA-related helping. Increased self-efficacy, faith-based practices, meeting attendance, number

of steps worked, having a sponsor, and length of sobriety predicted initial AA-related helping. Alcoholics reported elevated depressive symptoms before initial AA-related helping, lowered depressive symptoms at the start of AA-related helping, and similarly lowered depressive symptoms in the interval following initial AA-related helping. **Conclusions:** The profile of prospective helpers in AA is not limited to alcoholics from certain backgrounds or higher functioning in terms of drinking or clinical severity. To increase participation in AA-related helping, and hence outcomes, results suggest strengthening self-efficacy and progress in other AA programmatic components. (*J. Stud. Alcohol Drugs* 70: 117-125, 2009)

THE SYMBOL FOR ALCOHOLICS ANONYMOUS (AA), emblazoned on celebratory coins members receive for accumulating periods of sobriety, is a triangle representing AA's three core dimensions. One side of the triangle is Service, defined in the context of AA as "anything whatever that legitimately helps us to reach fellow sufferers" (AA, 1985, p. 140). Likewise, the 12th step is often taken as synonymous with helping and reads, "Having had a spiritual awakening as the result of these steps, *we tried to carry this message to alcoholics (italics added)*, and to practice these principles in all our affairs" (AA, 1981, p. 106). Service work ranges from visiting detoxification centers to being a sponsor. The role of a sponsor is to help other alcoholics to stay sober by sharing experiences and assisting their progress through the 12 steps.

Service work has a clear benefit to the survival of an organization. AA's emphasis on members helping other alcoholics builds a certain infrastructure to maintain operations, which may be partly responsible for AA's international presence and longevity (Emrick et al., 1993; McIntire, 2000;

Tonigan et al., 1996). Yet it is doubtful that betterment of the group alone is what motivates recovering alcoholics to give service. AA literature explains: "The average alcoholic, self-centered in the extreme, doesn't care for this prospect [service work]—unless he has to do these things in order to stay alive himself" (AA, 2001, pp. 22-23). An emerging body of literature points to the helper health benefits (Post, 2007) and sobriety benefits (Emrick et al., 1993; Pagano et al., 2004, 2007; Zemore and Kaskutas, 2004; Zemore and Pagano, 2008).

The current investigation extends prior work on service in alcohol research using data from Project MATCH (Matching Alcoholism Treatments to Client Heterogeneity; Project MATCH Research Group, 1993, 1997) to identify precipitating conditions of initial participation in AA-related helping (AAH). If helping assists the helper to stay sober, what are the precipitating characteristics of treatment-seeking alcoholics who go on to help other alcoholics? Although a copious literature examines predictors of 12-step affiliation broadly, little is currently known about the conditions facilitating active engagement in AA service activities. This study explores the influence of demographic, clinical, belief, and AA factors on initial participation in AAH.

## *Predictors of AA involvement*

Our predictors and hypotheses were based in part on conclusions from the literature on predictors of AA involvement, a latent construct with several identified components, including meeting attendance, step work, and having a sponsor.

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<sup>†</sup>Correspondence may be sent to Maria E. Pagano at the above address or via email at: maria.pagano@case.edu. Sarah E. Zemore is with the Alcohol Research Group, Public Health Institute, Emeryville, CA. Robert L. Stout is with the Decision Sciences Institute, Pacific Institute for Research Evaluation, Providence, RI.

Because of the moderate to high correlations between AA involvement components (Emrick et al., 1993), we expected predictors of AA involvement to have some overlap with predictors of initial AAH. Therefore, we used evidence of predictors linked to other AA involvement components as a proxy to guide our selection of predictors of initial AAH.

*Demographic factors.* Investigations studying predictors of AA involvement and service have not found strong and consistent effects for demographic characteristics, with the possible exceptions of gender, employment, and age (Crape et al., 2002; Pagano et al., 2004, 2007). There is some evidence to suggest that adults involved in AAH are more likely to be employed (Crape et al., 2002) and older (Pagano et al., 2004). However, given the lack of theory and inconsistent findings, we did not expect demographic characteristics to predict initial AAH.

*Clinical factors.* In contrast to the lack of distinguishing demographic characteristics, several clinical factors have consistently differentiated those who become highly involved in 12-step programs. The association between greater AA involvement and alcohol severity is well-documented (Kelly et al., 2000; Morgenstern et al., 1997; Timko et al., 1993; Tonigan et al., 1996; Weiss et al., 2000). Indicators of alcohol severity include higher levels of alcohol consumption and alcohol-related problems, requiring treatment in intensive settings, and increased number of prior treatments. The link between alcohol severity and AA involvement may be the result of the intermediating role of motivation or commitment to abstinence. Higher levels of motivation/commitment to abstinence are associated with higher AA participation (Morgenstern et al., 1997); greater participation in AA's rigorous program of action may increase the likelihood of AAH onset.

Furthermore, the clinical factors of depressive symptomatology and antisocial personality disorder (APD) may be linked to initial participation in AAH. There is some support for an association between higher depressive symptoms and reduced likelihood and intensity of AA involvement (Kelly et al., 2003; Timko et al., 1993); this may be the result of certain symptoms, such as extreme fatigue or weariness. APD symptoms, including an inability to make or keep friends and a tendency to violate the rights of others, may also reduce AA involvement, especially in interactive activities such as helping. There is some evidence that characteristics opposed to APD, such as interpersonal competence and sensitivity to others, relate to greater AA participation (Galaif and Sussman, 1995; Timko et al., 2006). Still, given the dearth of research on APD and AA involvement, we included APD as an exploratory variable in relation to helping behaviors. In sum, we expected clinical indicators of higher alcohol severity, higher readiness for change, and lower depressive symptomatology to predict initial AAH.

*Belief factors.* There is a large body of literature documenting the links between beliefs regarding religion or spiri-

tuality, drinking self-efficacy, and purpose in life with AA involvement (Carroll, 1993; Connors et al., 2001; Kelly and Moos, 2003; Morgenstern et al., 1997; Owen et al., 2003; Project MATCH Research Group, 1997; Timko et al., 2006; Tonigan et al., 2002). Thus, we expected higher participation in faith-based practices, confidence in one's ability to resist drinking, and purpose in life to predict initial AAH.

*AA factors.* Prior work on predictors of AA involvement (Emrick et al., 1993; Tonigan et al., 1996), one component of which is AAH, guided our empirically driven hypotheses regarding predictors of initial AAH. However, we also considered AA involvement components as time-varying predictors to examine their link to initial AAH, as well as control for their effects when examining other predictors. We had three hypotheses regarding AA factors: (1) twelve-step facilitation (TSF) treatment was expected to predict a greater likelihood of initial AAH given the established link between TSF treatment and AA involvement (Emrick et al., 1993; Humphreys, 1999; Timko et al., 2006); (2) two components of AA involvement—meeting attendance (Emrick et al., 1993) and step work (Gilbert, 1991)—were expected to predict initial AAH, given repetitive exposure to AA's primary purpose to help others; and (3) as a result of behavioral modeling, having a sponsor was expected to increase the odds of initial AAH.

*Length of sobriety.* We expected length of sobriety to predict initial AAH given the increased experiences living sober. This expectation was also driven by AA's literature that recommends sponsors to have 1 year or more of continuing sobriety (AA, 1983).

#### *Purpose of this article*

The purpose of this article is to identify demographic, clinical, belief, and AA factors that predict initial AAH among treatment-seeking alcoholics. To achieve this aim, our investigation highlights the use of event history analysis with time-varying explanatory covariates. In essence, this technology allowed us to examine the predictability of explanatory variable scores as assessed at the time of a prospectively observed event. This statistical methodology uses a partial maximum likelihood function derived from the values of covariates for all subjects in the risk set at the time of each observed event (see Allison, 1995, for a mathematical overview of Cox models). This study applies time-varying statistical analysis to adequately model fluctuating conditions, such as behaviors, beliefs, and moods as they relate in time to the course of involvement in AA (Stout and Papandonatos, 2003).

#### **Method**

Our study was based on Project MATCH, a longitudinal investigation of the efficacies of three behavioral interventions for individuals with alcohol-use disorders delivered

over 12 weeks (Longabaugh and Wirtz, 2001). The three theoretically derived psychosocial interventions selected for use in this randomized clinical trial were (1) cognitive-behavioral therapy, (2) motivational enhancement therapy, and (3) TSF. Project MATCH included 1,726 patients in treatment for alcohol abuse and dependence. There were two study arms: (1) outpatient and (2) aftercare. Patients in the outpatient arm were recruited directly from the community or outpatient centers ( $n = 952$ ). Patients in the aftercare arm were recruited from intensive inpatient or day-hospital treatment ( $n = 774$ ). Inclusion criteria included participation in either current treatment (for the outpatient arm) or treatment in the prior 3 months (for the aftercare arm) for alcohol abuse or dependence according to criteria from the Diagnostic and Statistical Manual of Mental Disorder, Third Edition, Revised (DSM-III-R; American Psychiatric Association, 1987). Exclusion criteria included current DSM-III-R diagnosis of sedative/hypnotic drug, stimulant, cocaine, or opiate dependence; intravenous drug use during the previous 6 months; current danger to self or others; symptoms of acute psychosis; and/or severe organic impairment. Detailed information regarding the overall aims, organizational structure, and research design of Project MATCH is explicated elsewhere (Babor et al., 2003).

### Measures

We first describe our dependent variable, initial participation in AAH, followed by our static and time-varying predictor variables. Static predictor variables were those measured once: demographic variables, most clinical factors (pretreatment alcohol severity, treatment history, treatment setting, readiness for change, APD), and TSF treatment assignment. All time-varying predictor variables under investigation adhered to a uniform follow-up schedule in Project MATCH (baseline or before treatment, 3 months, 9 months, 15 months): depressive symptoms, belief factors (religious behaviors, self-efficacy, purpose in life), AA factors (meeting attendance, step work, having a sponsor), and length of time sober.

*Initial AA-related helping.* Initial AAH was assessed with the AA involvement questionnaire (Tonigan et al., 1996), a well-validated measure of AA affiliation developed for use in Project MATCH (Tonigan et al., 1996). The AA involvement scale consists of 13 items, 8 of which are scored dichotomously. Using the same criterion as a previous investigation (Pagano et al., 2004), initial AAH was defined by endorsement of two AA involvement items: (1) being a sponsor and/or (2) Step 12 completion (previously described) in the last 90 days. The first endorsement of these two items after the baseline assessment identified initial AAH.

*Demographic factors.* Demographic characteristics of participants included gender, race, marital status, full-time employment status, age, and years of education.

*Clinical factors: Alcohol severity.* Alcohol severity was measured as the number of drinks per drinking day, using the semi-structured Form 90 (Miller and Tonigan, 1996). Form 90 is a calendar-based daily drinking estimation method that incorporates a grid-averaging approach to provide a comprehensive and efficient assessment of a person's drinking over a designated period (90 days in this study). It has demonstrated test-retest reliability for treatment-seeking alcoholics (Tonigan et al., 1997) and problem use of illicit drugs (Westerberg et al., 1998). Additionally, time to first drink from the nominal end of treatment at Month 3, a primary time-to-event outcome measure used in Project MATCH (Babor et al., 2003), was used to measure length of time sober in months.

Two additional indicators of alcohol severity were (1) treatment history and (2) treatment setting. Treatment history was ascertained by the number of prior treatments. Treatment setting, from which participants were recruited, refers to the level of care provided by the study arm (outpatient or aftercare). Prior analyses in Project MATCH consistently found higher alcohol severity and alcohol-related consequences among aftercare participants (Tonigan et al., 2003).

*Stages of Change Readiness and Treatment Eagerness Scale.* Readiness to change was assessed with the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES; Miller and Tonigan, 1996). SOCRATES provides a continuous measurement of motivational processes that underlie the stages of change specific to drinking. Nineteen items are scored on a 5-point Likert scale and summed. SOCRATES has demonstrated adequate internal consistency (Cronbach's alphas ranging from .60 to .83) and excellent test-retest reliability (Pearson  $r$ 's ranging from .83 to .91; Miller and Tonigan, 1996).

*Depressive symptoms.* Depressive symptoms were assessed with the Beck Depression Inventory (BDI; Beck et al., 1961). The BDI has been used for more than 25 years to identify depressive symptoms in a wide range of populations (Beck et al., 1988). Twenty-one items are scored on a 4-point Likert scale and summed. The BDI has demonstrated adequate psychometric properties with high internal consistency (.92) and test-retest reliability (.93; Beck et al., 1988).

*Antisocial personality disorder.* APD was assessed with a computerized administration of the National Institute of Mental Health Diagnostic Interview Schedule (Robins et al., 1981). Designed to make diagnoses according to DSM-III criteria, Feighner criteria (Feighner et al., 1972), and research diagnostic criteria (Spitzer et al., 1978), the computerized Diagnostic Interview Schedule has demonstrated adequate test-retest reliability (alphas ranging from .60 to .70) and concordant validity ( $\kappa = .57-.86$ ; Robins et al., 1981).

*Belief factors: Religious behaviors.* Religious behaviors were measured with the Religious Background and Behavior (RBB) questionnaire (Connors et al., 1996). The RBB is a 13-item measure that taps such domains as the use of prayer

and meditation, reading of scripture, attendance at worship services, and experiences of God. Items are summed for a total score ranging from 0 to 60. The RBB has demonstrated good internal reliability ( $\alpha = .86$ ) and excellent test-retest reliability (Pearson  $r = .97$ ; Connors et al., 1996).

*Self-efficacy.* Self-efficacy regarding alcohol abstinence was assessed with the Alcohol Abstinence Self-Efficacy Scale (AASE; DiClemente et al., 1994). The AASE is a 20-item self-report measure designed to assess Bandura's (1977) construct of self-efficacy applied to alcohol abstinence. Subjects rate their vulnerability to drink and confidence to abstain from alcohol across 20 different high-risk situations on a 5-point Likert scale. Items are summed for a summary score that reflects the average rating across the 20 high-risk situations.

*Purpose in Life Test.* The Purpose in Life Test (PIL; Crumbaugh, 1968) assessed the current perception of meaning and purpose in life. The PIL consists of 20 items that are rated on a 7-point Likert scale. As an example, one item asks: "If I could choose, I would..." and the choices range from "prefer never to have been born (1)" to "live nine more lives just like this one (7)." Items are summed to form a total PIL score ranging from 20 to 140. The PIL has demonstrated high internal consistency (.91), high test-retest reliability (.90), and adequate concordant validity ( $\kappa$ 's ranging from .61 to .89; Black, 1991; Molasso, 2006; Zika and Chamberlain, 1992).

*AA factors.* Four factors within the context of AA were pre-specified as predictors of helping behaviors: (1) AA meeting attendance, (2) step work, (3) having a sponsor, and (4) receipt of TSF treatment. These factors were assessed using items from the AA involvement scale (Tonigan et al., 1996). The number of meetings attended was converted to 4 deciles that were then separately divided by 10, resulting in a value ranging from .01 to 1.00. Completed step work was measured from the continuous AA involvement item asking respondents to endorse what steps (Nos. 1-11) they completed during the assessment period; individual steps endorsed were summed for a total score of steps "worked." Having a sponsor was measured from one AA involvement item that is dichotomously scored (yes/no). The receipt of TSF versus not (cognitive-behavioral therapy or motivational enhancement therapy) was ascertained from Project MATCH's randomized treatment assignment.

### *Statistical analysis*

Statistical analyses were conducted with SAS Version 8.0 (SAS Institute Inc., Cary, NC), using the PHREG procedure for Cox proportional hazard regression analyses. Univariate comparisons were performed to examine pretreatment demographic or clinical differences between those who subsequently initiated AAH and those who did not. Cox regression models were performed using a two-stage ap-

proach. Demographic characteristics were first entered into Cox regression models. At the second stage, nonsignificant demographic variables were removed using the default of .10 for probability to remove. This two-stage approach was used (1) because demographic characteristics have not been predictive of alcohol outcomes in general and (2) to limit the number of predictor variables to the recommended 1:20 ratio (Allison, 1995). To reduce potential collinearity (Aiken and West, 1991), baseline assessments of static predictor scores were centered by subtracting the sample mean from each score. The intrarelation correlations between predictor variables at baseline were low (Pearson  $r = .01-.30$ ), with one moderate correlation between BDI and PIL scores ( $r = -.54$ ). Consecutive interval correlation matrix patterns were similar but reduced in magnitude.

The point in time when individuals began to help others varied. AAH was first observed at three possible points: (1) 3-month assessment, (2) 9-month assessment, and (3) 15-month assessment. Three times were used to locate preceding indicator scores for time-varying variables, respectively: baseline assessment, which references the 3 months before treatment, 3-month assessment, 9-month assessment. For time-varying predictor variables, indicator scores were tagged to the interval preceding the interval in which initial AAH was observed. For example, if initial AAH was observed at the 3-month assessment, indicator scores are tagged to the baseline assessment. Tests for violations of the proportional hazard assumption found no evidence of nonproportionality in Cox regression models. Results of a sensitivity analysis found no appreciable effect of possible informative censoring on parameter estimates. We reported all two-tailed tests with significance values greater than 95% ( $p < .05$ ).

## **Results**

### *Sample demographic characteristics*

This investigation's sample consisted of 1,593 participants with complete baseline and 3-month follow-up assessment data on all study measures. There were no significant differences between study participants ( $N = 1,593$ ) and participants with incomplete 3-month data ( $n = 133$ ) in terms of demographic or predictor variables at baseline. The majority of the sample was retained across the 15-month study period: 86% (1,374/1,593) completed a 9-month interview, and 81% (1,286/1,593) completed a 15-month interview. Characteristics of the study sample at baseline are presented in Table 1. Study participants were predominantly male (76%), white (83%), and single (65%). Fifty-percent were employed full time. On average, participants were in their early 40s (mean [SD] = 40.29 [10.99] years), had graduated from high school, and had approximately 1 year of college or technical training (mean = 13.28 [2.11] years of education). Involvement in AA

activities was minimal in the 90 days before study participation (see Tonigan et al., 1996, for detailed information on the sample's prior involvement in AA).

A total of 243 participants began to help others within 12-step contexts over the course of the 15-month study period. Fifty-one percent of helpers reported initial AAH at the 3-month interval, 25% reported initial AAH at the 9-month interval, and 23% reported initial AAH at the 15-month interval. Univariate comparisons at baseline found no distinguishing demographic or clinical characteristics between those who began to help others during follow-up ( $n = 243$ ) and those who did not ( $n = 1,350$ ), with the exception of older age ( $F = 19.20$ , 1/1,592 df,  $p < .0001$ ). Those who initiated AAH were more likely to have a history of higher AA meeting attendance ( $F = 30.13$ , 1/1,497 df,  $p <$

.0001), and being sponsored ( $\chi^2 = 63.55$ , 1 df,  $p < .0001$ ). Prior history of providing sponsorship was associated with subsequent AAH during follow-up ( $\chi^2 = 59.88$ , 1 df,  $p < .0001$ ), although most participants initiating AAH (88%) had no prior history. For the length of time followed in the study, the majority of those who initiated AAH continued to help others (92%). All were sober at initial AAH and follow-up intervals when involved in AAH.

#### *Predictors of initial AA-related helping*

*Demographic and clinical factors.* In the preliminary Cox regression (not shown), none of the demographic characteristics assessed predicted initial AAH, except for age. However, the positive relationship between age and initial AAH did not replicate in the final multivariate models (see Table 2).

In the final, multivariate Cox model (Table 2), the following pretreatment characteristics did not predict initial AAH: age, drinks per drinking day, treatment history, treatment setting, readiness to change, and APD. In the direction opposite to that expected, a significant positive relationship was found between BDI scores and initial AAH. Individuals with higher levels of BDI scores in the prior interval were more likely to begin to help others ( $p < .05$ ).

*Belief factors.* As hypothesized, increased RBB and AASE scores were found to be significantly related to initial AAH (see Table 2). The likelihood of initial AAH increased by 2% for each one unit increase in RBB total score ( $p < .01$ ) and 19% for each one unit increase in AASE total score ( $p < .05$ ). However, no significant relationship was found between PIL scores and initial AAH ( $p = .15$ ).

*AA factors.* The majority of hypotheses regarding AA factors were confirmed. Table 2 shows very strong effects for both the number of meetings attended and steps worked in the prior interval. In addition, those who had a sponsor in the prior interval were about two times more likely to begin to help others ( $p < .001$ ). However, contrary to expectation, assignment to TSF bore no relation to initial AAH.

*Length of time sober.* Greater length of sobriety predicted initial AAH ( $p < .0001$ ). The likelihood of initial AAH increased 6.4% with each additional month sober.

*Course of depressive symptoms and initial AA-related helping.* To clarify the finding for depressive symptoms, we conducted one post hoc analysis among participants who began to help others after the baseline assessment. We designated the interval of initial AAH as Time Point 0. BDI scores were then assembled relative to Time Point 0, with up to two intervals preceding and following Time Point 0. Because the focus of our analysis was on change in depressive symptoms before and after initial AAH, we also required that subjects have at least one interval of nonmissing scores immediately before and after Time Point 0. We modeled depressive symptoms over time for each subject as an interrupted time series (Allison, 2005) with four random effects: (1) intercept, (2)

TABLE 1. Intake characteristics of study participants

Intake characteristic	Total Mean (SD) or $n$ (%) ( $n = 1,593$ )
<b>Demographic Factors</b>	
Gender, $n$ (%)	
Male	1,207 (76%)
Female	386 (24%)
Race, $n$ (%)	
White	1,316 (83%)
Black	151 (9%)
Other	126 (8%)
Marital status, $n$ (%)	
Married	555 (35%)
Single	1,038 (65%)
Employed full time, $n$ (%)	
No	791 (50%)
Yes	802 (50%)
Age, mean (SD)	40.29 (10.99)
Years of education, mean (SD)	13.28 (2.11)
<b>Clinical factors</b>	
Drinks per drinking day, mean (SD)	16.70 (10.73)
Treatment history, mean (SD)	1.27 (2.16)
Treatment setting, $n$ (%)	
Outpatient	858 (54%)
Aftercare	735 (46%)
SOCRATES, mean (SD)	12.06 (3.84)
Beck Depression Inventory, mean (SD)	10.15 (8.24)
Antisocial personality, $n$ (%)	
No	1,381 (87%)
Yes	212 (13%)
<b>Belief factors, mean (SD)</b>	
Religious background and behaviors	36.79 (11.24)
Self-efficacy	3.06 (0.92)
Purpose in life	93.88 (18.94)
<b>AA factors</b>	
No. of AA meetings, mean (SD)	0.03 (0.11)
No. of AA steps worked, mean (SD)	1.86 (2.88)
Has AA sponsor, $n$ (%)	
No	1,162 (73%)
Yes	427 (27%)
TSF treatment, $n$ (%)	
No (CBT)	520 (33%)
No (MET)	532 (33%)
Yes	541 (34%)

Notes: SOCRATES = Stages of Change Readiness and Treatment Eagerness Scale; AA = Alcoholics Anonymous; TSF = twelve-step facilitation; CBT = cognitive-behavioral therapy; MET = motivational enhancement therapy.

TABLE 2. Predictors of participation in AA-related helping

Variable	Parameter estimate (SE)	$\chi^2$	$pr > \chi^2$	Hazard ratio (95% CL)
<b>Demographic factors</b>				
Age	.00930 (.00656)	2.0081	.1765	1.009 (0.996-1.022)
<b>Clinical factors<sup>a</sup></b>				
Drinks per drinking day	.00836 (.00644)	1.6889	.1937	1.008 (0.996-1.021)
Treatment history	-.00911 (.03102)	0.0862	.7691	0.991 (0.932-1.053)
Treatment setting	.04685 (.15856)	0.0873	.7676	1.048 (0.768-1.430)
Readiness to change	.00066 (.02177)	0.0009	.9756	1.001 (0.959-1.044)
Depressive symptoms <sup>b</sup>	.02235 (.01023)	4.7713	.0289	1.023 (1.002-1.043)
Antisocial personality disorder	-.18621 (.22356)	0.6937	.4049	0.830 (0.536-1.287)
<b>Belief factors<sup>b,c</sup></b>				
Religious practices	.01993 (.00695)	8.2168	.0042	1.020 (1.006-1.034)
Self-efficacy	.17373 (.07451)	5.4367	.0197	1.190 (1.028-1.377)
Purpose in life	.00703 (.00491)	2.0527	.1519	1.007 (0.997-1.017)
<b>AA factors<sup>b</sup></b>				
No. of AA meetings attended	.91594 (.28840)	10.0866	.0015	2.499 (1.420-4.398)
No. of steps worked	.15261 (.02174)	49.2901	.0001	1.165 (1.116-1.216)
Has a sponsor	.59834 (.17342)	11.9046	.0006	1.819 (1.295-2.555)
TSF treatment	.02194 (.08813)	0.0620	.8034	1.022 (0.860-1.215)
Length of time sober <sup>b,d</sup>	.06233 (.01590)	15.3703	.0001	1.064 (1.032-1.098)

Notes: AA = Alcoholics Anonymous; CL = confidence limits; TSF = twelve-step facilitation. <sup>a</sup>Drinks per drinking day was measured with the semistructured Form 90. Treatment history refers to number of prior treatments. Treatment setting refers to treatment care level (outpatient vs aftercare). Readiness to change was measured with the Stages of Change Readiness and Treatment Eagerness Scale. Depressive symptoms were measured with the Beck Depression Inventory. Antisocial Personality Disorder was assessed with National Institute of Mental Health Diagnostic Interview Schedule. <sup>b</sup>Time-varying assessments. <sup>c</sup>Religious practices and beliefs were assessed with the Religious Background and Behavior questionnaire. Self-efficacy was assessed with the Alcohol Abstinence Self-Efficacy Scale. Purpose in life was assessed with the Purpose in Life Test. <sup>d</sup>Length of time sober was assessed using the semistructured Form 90.

linear change in BDI scores over time, (3) shift in the mean BDI score around Time Point 0, and (4) change in the slope of BDI scores after Time Point 0. The model was fitted using a compound symmetry within-subject variance-covariance matrix and controlled for static covariates modeled in the Cox regression. Results indicated a significant shift in BDI scores around Time Point 0 ( $F = 18.79$ ,  $2/317$  df,  $p < .0001$ ) that reflected elevated BDI scores in the preceding interval (mean = 10.29 [0.58]), significantly lower BDI scores at the time of starting to help others (mean = 7.20 [0.58]), and similarly lowered BDI scores in the following interval (mean = 7.20 [0.63]).

## Discussion

Prior work has demonstrated the reduced risk of relapse associated with alcoholics who begin to help others in AA as part of their program of recovery (Pagano et al., 2004). This investigation expands prior work of AAH to include later onset of AAH in the year following treatment. Of the 15% of treatment-seeking alcoholics who began 12-step work with other alcoholics, 50% initiated AAH in the year following treatment, because more time sober increased the odds of starting to help others within AA. The majority of alcoholics who initiated AAH continued to participate in AAH, and all helpers were sober when helping others. The longitudinal view of AAH aside, the aim of this study was to further understanding of the conditions that precede initial participa-

tion in AAH. In addition, this work addresses the question of whether helping behaviors are simply a marker of those with more resources and better psychological health.

As expected, and consistent with other studies of AA involvement, the background characteristics of gender, race, age, marital status, education, and employment status of alcoholics seeking treatment did not differentiate those who went on to help others. A similar pattern was found for the majority of clinical severity indicators: alcohol severity, treatment setting, history of prior treatments, readiness for change, and APD were not related to initial AAH. Contrary to expectation, adults presenting with a wide range of alcohol severity appear equally as likely to initiate AAH. Established links between clinical severity indicators and AA involvement more broadly (Emrick et al., 1993; Humphreys, 1999) were not replicated with reference to initial AAH. These results imply that AAH activities are not limited to individuals of a certain educational, gender, race, marital, employment, antisocial personality status, or problem history. Accordingly, as demonstrated in prior work (Pagano et al., 2004), the benefits derived from helping are not limited to certain types of alcoholics based on background and presenting clinical characteristics.

The one clinical factor linked to increased likelihood of initial AAH challenges the assumption of helping as a signal for higher psychological health. Prior research explored this assumption and found no link between psychological health and participation in helping activities (Zemore and Kaskutas,

2004). Our study also did not find support for higher psychological health as a prerequisite for beginning initial AAH. Instead, we found that individuals with higher levels of depressive symptoms subsequently engaged in AAH. Their depressive symptoms lowered in tandem with service involvement, suggesting salutary effects of helping. This finding was discovered with the application of time-varying statistical methods to alcohol research. Researchers are encouraged to use this technology to further understanding of variable conditions (e.g., mood) in relation to fluctuating alcohol outcomes (e.g., AAH).

Hypotheses pertaining to belief factors were largely confirmed. Controlling for levels of AA affiliation, increased practice of faith-based behaviors and confidence in one's ability to resist temptation predicted initial AAH. Findings are noteworthy for extending prior work relating greater spirituality to greater helping (e.g., Zemore and Kaskutas, 2004). Notably, prior work in Project MATCH found no link between religious orientation and 12-step participation (Tonigan et al., 2002). A clear link was found between RBB scores and initial AAH. The spiritual mechanisms responsible for behavioral change in AA warrant further investigation, such as the federally funded secondary analysis project in Project MATCH (NIAAA grant R21 AA016762) that is currently under way. Lastly, a notable link was found between alcohol self-efficacy and initial AAH. It is likely that confidence to resist temptation is in turn further strengthened as a result of giving service. Because temptation to drink may actually increase in the company of active alcoholics, future research is needed to ensure that alcohol self-efficacy is not negatively influenced by recipient characteristics. Although in the hypothesized direction, prior PIL levels did not significantly relate to initial AAH, it may be that PIL increases as a result of initial AAH—a relationship that warrants future investigation.

Three of the four hypotheses pertaining to AA factors were confirmed. The more meetings attended, step work completed, and sponsorship received, the more likely alcoholics were to perform 12-step work. More time sober also predicted initial AAH. These findings make sense in light of Bill Wilson's comment that, "you cannot transmit what you do not have" (AA, 2001, p. 164). Providing sponsorship or carrying a message to other alcoholics implies having experience to transmit; these results suggest such experience accrues from increased meeting attendance, personal progress through the 12 steps, learning how to give AAH from receiving help from a sponsor, and more time sober.

In contrast to supported hypotheses, the hypothesis of receiving TSF treatment and greater odds of initial AAH was not confirmed. Although linked to increased participation in many AA programmatic components (Humphreys, 1999), TSF treatment given by professionals does not appear to promote initial participation in AAH. To maximize helping behaviors and hence outcomes, TSF programs may consider

emphasizing the helper benefits from helping and explicitly encourage AAH participation while strengthening self-efficacy to resist drinking.

There are several limitations to consider when interpreting the results of this study. First, although several hundred adults in this large national sample began to help others that allowed adequate modeling of study predictors in a 1:20 variable per events ratio, there was insufficient power to detect small effects of associations between characteristics and AAH onset. Second, this study used a narrow view of service activities based on a two-item construct from prior work (Pagano et al., 2004). Several recovery-oriented helping scales have since been developed to better assess the myriad ways that alcoholics help others in recovery. The research of Kaskutas and colleagues (Kaskutas et al., 2002, 2007; Zemore and Kaskutas, 2004; Zemore et al., 2004) has broadened the narrow conceptualization of helping beyond sponsorship or the 12th step. Other forms of AA service partaken by newcomers and old timers alike include making coffee, greeting members at the door, putting away chairs, visiting detoxification centers, volunteering at local AA Service Centers, welcoming newcomers at meetings, and sharing experiences in sobriety to help a fellow sufferer. As research further elucidates the service activities that exist within the orb of AA helping, much work is needed to determine which helping matters most to staying sober. Third, we were unable to examine social and contextual variables within 12-step settings as predictors of service participation. Future research is needed to explore influential ingredients within AA environments that further participation in AAH. Fourth, the population in this study consisted of adults only; additional studies are needed to determine if study findings are replicated among youth. Fifth, and lastly, given the minimal depression range of BDI scores in the sample, findings relating higher depression to greater likelihood of initial AAH may not apply to alcoholics with more severe depression. Replication of lowered BDI scores in relation to initial AAH among diverse alcohol populations is also needed.

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