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Does Pathway into 12-Step Programs Influence 12-Step-Related Benefit?

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Abstract

Most 12-step research recruits participants who are seeking treatment (cf. Kaskutas, Turk, Bond, & Weisner, 2003; Robinson, Cranford, Webb, & Brower, 2007), leaving open the question of how non-treatment-seeking individuals respond to 12-step involvement. The current study examined whether participants recruited from community-based Alcoholics Anonymous (AA) clubs or via advertisement/word-of-mouth differed in their 12-step attendance rates, substance use, and the association between these constructs compared to participants recruited from substance abuse treatment. Multilevel analyses showed that while associations between 12-step attendance and improved substance use did not differ by recruitment group, participants recruited from community-based AA clubs had higher 12-step attendance rates and a higher proportion of alcohol abstinent days than did all other participants. Results indicate that using diverse recruitment strategies may be necessary to obtain samples that are representative of the actual population of 12-step affiliates and to achieve results that estimate the true magnitude of 12-step effects.

Keywords

Alcoholics Anonymous; 12-step; recruitment; sample bias; substance abuse treatment

Community-based 12-step programs are frequently attended by substance abusers seeking help, and about 88% of treatment providers in the United States report that they encourage 12-step attendance and practices either “often” or “sometimes” (SAMHSA, 2007). Studies on the effectiveness of 12-step programs, however, have been plagued by problems of self-selection (Emrick, Tonigan, Montgomery, & Little, 1993). Primary among these problems regards the question of whether substance abusers who attend 12-step programs systematically differ from those who do not as well as whether those who remain in 12-step programs systematically differ from those who drop out. In response to these challenges recent studies have applied complex longitudinal analyses to statistically control for third variable explanations that may explain the substance use reductions of 12-step members.

Examples of such control variables include an array of demographic variables (e.g., age, ethnicity, gender, marital status and employment status; cf. Kelly, Stout, Magill, & Tonigan, 2011), concurrent formal treatment (Tonigan & Beatty, in press), and readiness for change (Tonigan & Rice, 2010) to name only a few. In general, findings from these prospective studies are consistent with meta-analytic summaries of the less rigorous correlation-based 12-step literature (e.g., Tonigan, Toscova, & Miller, 1996) that have shown 12-step attendance to be associated with small-to-modest increases in abstinence for many, but not all, substance abusers.

Prospective studies of 12-step participation have relied almost exclusively on the recruitment of treatment-seeking samples (cf. Kaskutas et al., 2003; Kelly et al., 2011; Robinson et al., 2007). According to the most recent AA membership survey, however, only a third (33%) of AA members are introduced to AA through a treatment facility or counseling agency, and just 7% are referred to AA by health professionals (AA, 2007). In comparison, the survey reports that 31% of individuals are self-motivated to attend AA. Given researchers' tendency to sample from treatment-seeking populations, it is not clear whether these self-motivated AA affiliates receive the same benefit as do those who enter AA at the advice and encouragement of treatment providers. Likewise, little is known about whether different pathways into 12-step programs influence individuals' engagement in prescribed 12-step activities.

Indirect evidence suggests that it may not be prudent to generalize findings drawn from treatment seeking samples to all who attend 12-step programs. Specifically, Morley, Teesson, Sannibale and Haber (2009) found that participants recruited using advertisements had greater social stability, higher levels of education, and significantly lower levels of alcohol dependence at baseline than did participants who were referred from inpatient and outpatient treatment programs. In addition, their inpatient referrals had worked more of the 12 steps at intake than had participants recruited via advertisement. Conversely, a study on treatment for crack cocaine dependency showed that, compared to participants referred from Veterans Affairs hospitals, participants recruited using advertisements were more likely to have greater medical or dual diagnosis needs and were more difficult to assist due to legal, time, and social agency constraints. They were also more likely to be African American and to have a primary addiction to crack cocaine. In comparison, participants referred from Veterans Affairs hospitals were more likely to be white and to have polysubstance use disorders (Piotrowski, Clark, & Hall, 1994). These findings suggest that recruitment source may introduce systematic heterogeneity into studies on substance abuse treatment. To the extent that these findings generalize to 12-step research, we may find that recruitment source needs to be accounted for in our assessment of the benefits that can be attributed to 12-step involvement.

This investigation had three aims. First, we investigated whether baseline demographic characteristics, alcohol and substance use, and 12-step attendance rates differed between groups recruited from community-based AA clubs, substance abuse treatment programs, and advertisements or word-of-mouth. Second, we evaluated whether recruitment source was predictive of drinking and illicit drug use outcomes over 9 months. Third, we investigated whether the association between 12-step attendance and increased abstinence was moderated

by recruitment source. Here, we anticipated a gradient effect that would show 12-step-related benefit to be strongest for the participants recruited from community-based AA, followed by participants recruited from treatment and then by participants recruited via word-of-mouth and advertisements.

Method

Participants were 130 adults recruited from treatment programs ($n = 66$), community-based AA programs ($n = 27$), and via advertisement and word-of-mouth ($n = 33$; R21AA017131, Tonigan PI). Recruitment source data were missing for four participants. To ensure that data reflected the initial mobilization and trajectories of behavior change among individuals new to AA, individuals were excluded if they reported more than 16 weeks of lifetime AA exposure and/or if they had previously abstained from alcohol for 12 months or longer. All participants met current *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association [DSM-IV-TR], 2000) criteria for either alcohol abuse or dependence, had attended at least one AA meeting in the previous 90 days, and had used alcohol in the previous 3 months. Participants were not excluded if they met criteria for either illicit drug abuse or dependence. Table 1 describes participants' demographic characteristics and shows that participants were mostly Hispanic ($n = 56$, 43.1%) or white ($n = 46$, 35.4%), about half ($n = 68$, 53.8%) were male, their average age was 39 ($SD = 9.6$), and most were single ($n = 99$, 78.5%) and unemployed ($n = 90$, 71.5%).

All participants provided informed consent before completing study assessments. Prior to each assessment, participants were administered breathalyzers to ensure that their blood alcohol concentration was not greater than .05. Interviews were conducted at study intake and at 3, 6, and 9 months after baseline. Participants received \$50 for each completed interview. No intervention was administered in this assessment-only study but clinical staff made referrals to treatment when participants requested it or when staff thought a referral was warranted. The institutional review board at the University of New Mexico approved all procedures and assessments (UNM Protocol # 27147).

Alcohol and other drug use, treatment attendance, and 12-step attendance were assessed using the *Form 90* interview (Miller, 1996). Two measures of alcohol use were derived from *Form 90* data, namely proportion of days abstinent from alcohol (PDAA) and drinks per drinking day (DPDD). To calculate PDAA, we divided the number of alcohol abstinent days in the given assessment period by the total number of days in the assessment period. Drinks per drinking day were measured by assessing the amount of drinks consumed per drinking day divided by the number of drinking days in a period (abstinent days not included in the denominator). The proportion of days that participants took their most frequently used illicit drug (PDD) was assessed by determining which drug (among cannabis, sedatives, hypnotics, amphetamine, cocaine, hallucinogens and/or opioids) the participant used most often in each assessment period and then dividing the amount of days on which the participant used this drug by the total number of days in the assessment period. *Form 90* data was also used to calculate the proportion of days on which participants attended treatment and 12-step meetings. For each assessment period, we divided the number of days on which participants reported attending either treatment or 12-step meetings and divided each of these amounts

by the total days in each assessment period. All of these measures have demonstrated reliability (Hettema, Miller, Tonigan, & Delaney, 2008; Slesnick & Tonigan, 2004; Tonigan, Miller, & Brown, 1997; Westerberg, Miller, & Tonigan, 1999).

Results

At baseline, participants' average percent of alcohol use days was 43.9%, they used drugs on an average of 27.4% of days, and they had an average score on the Alcohol Dependence Scale (ADS; Skinner & Allen, 1982) of 47.91 ($SD = 10.05$). Table 2 describes participants' 12-step attendance and substance use throughout the study. On average, participants attended 12-step meetings on 20% of days from the 90 days prior to baseline to the 9-month follow-up. The overall sample reported significant pre-post improvement on all measures of substance use. Proportion of days abstinent from alcohol significantly increased from baseline ($M = .56$) to the 9-month interview ($M = .72$; $t(113) = 5.33$, $p < .0001$, $d = .51$), average DPDD decreased from 14.02 ($SD = 9.13$) to 9.60 ($SD = 8.80$; $t(112) = -5.90$, $p < .0001$; $d = .49$), and PDD decreased from an average of .28 ($SD = .33$) to .19 ($SD = .30$; $t(112) = -2.66$, $p = .01$, $d = .29$).

The first aim of the study was to evaluate whether recruitment groups differed from each other in terms of demographic characteristics, baseline alcohol and substance use, and 12-step attendance rates. Results from chi-square analyses and general linear models showed no significant differences between groups with respect to gender or ethnic composition, marital status or employment status (all p s $> .07$). Recruitment groups also did not differ by age ($F(2, 216.31) = 2.37$, $p = .10$), household income ($F < 1$), or years of education, $F(2, 21.13) = 2.33$, $p = .10$. In addition, there were no significant differences between recruitment groups with respect to their baseline levels of substance use, specifically PDAA ($F < 1$), DPDD ($F < 1$), and PDD, $F(2, .17) = 1.51$, $p = .23$).

Multilevel analyses that included the proportion of 12-step attendance days as the criterion variable, intercept as a level-1 predictor, contrast-coded indicators of recruitment source as level-2 predictors, and treatment attendance as a level-1 covariate showed that participants recruited from AA clubs attended 12-step meetings on a significantly greater proportion of days throughout the study than did all other participants, $B = .42$, $t(129.06) = 4.95$, $p < .0001$. To assess whether change over time in 12-step attendance differed by recruitment source, we conducted a second set of analyses that were identical to the first except that they included two additional predictors: time (on level-1) and a cross-level interaction between time and recruitment source. Results indicated that change over time in 12-step attendance did not differ according to recruitment source, $F < 1$.

Given that recruitment groups were modestly different with respect to gender composition (e.g., the percentage of men recruited from community-based AA was marginally greater than the percentage of men recruited from other sources, $\chi^2(2) = 5.26$, $p = .07$), we conducted a secondary analysis to evaluate whether recruitment source would be significantly associated with 12-step attendance after controlling for gender. Results from a multilevel analysis including intercept on level-1 and recruitment source and gender on level-2 showed that both recruitment source ($F(2, 123.14) = 11.55$, $p < .0001$) and gender

($F(1, 120.79) = 4.30, p = .04$) were significantly associated with 12-step attendance. Men had greater 12-step attendance than women ($B = .07, t(120.79) = 2.08, p = .04$) and participants recruited from AA clubs still had greater AA attendance than did all other participants ($B = .40, t(127.66) = 4.54, p < .0001$). These results indicate that the effect of recruitment source on 12-step attendance occurred despite the overrepresentation of men in the sample recruited from community-based AA.

The second aim of the study was to assess whether the course of participants' substance use varied according to recruitment source. To achieve this aim, we conducted multilevel analyses to evaluate associations between recruitment source, mean levels of PDAA, DPDD, and PDD, and change over time in substance use. An analysis including PDAA as a criterion variable, intercept as a level-1 predictor, and a dummy-coded indicator of recruitment source as a level-2 predictor showed that participants recruited from community-based AA clubs had a significantly higher average PDAA throughout the study than did participants recruited from all other sources, $B = .10, t(128.49) = 1.95, p = .05$. However, the effect of recruitment source on mean PDAA became only marginally significant when proportion of treatment days were included as a level-1 covariate, $B = .09, t(109.70) = 1.82, p = .07$. An analysis evaluating whether change over time in PDAA differed according to recruitment source returned insignificant results, $F < 1$. Multilevel analyses also showed that there were no differences between recruitment groups in mean levels or change over time in either DPDD or PDD (all p s $> .12$).

The third study aim was to evaluate whether recruitment source moderated the relation between AA attendance and outcome. Preliminary analyses showed that the mean proportion of days on which participants attended AA throughout the study was significantly associated with increased PDAA ($B = .35, F(1, 450.34) = 37.95, p < .0001$), decreased DPDD ($B = -3.80, F(1, 464.94) = 4.63, p = .03$), and decreased PDD ($B = -.12, F(1, 468.98) = 4.64, p = .03$). However, multilevel analyses that included intercept on level-1 and recruitment source, proportion of 12-step attendance days, and proportion of treatment days on level-2 showed that recruitment source did not interact with 12-step attendance to predict PDAA ($F < 1$), DPDD ($F(2, 450.74) = 2.12, p = .12$), or PDD, ($F(2, 437.10) = 1.26, p = .28$).

Discussion

Results showed that participants recruited from community-based AA had higher levels of 12-step attendance and a higher average proportion of alcohol abstinent days throughout the study than did all other participants. However, despite these differences, the association between 12-step attendance and days abstinent from alcohol did not differ by recruitment group. Several implications may be drawn from the study findings. To date, 12-step researchers have recruited almost solely from treatment-seeking populations (cf. Kaskutas et al., 2003; Kelly et al., 2011; Robinson et al., 2007). Thus, results from existing research may underestimate the effect that 12-step participation has on abstinence rates. Our results also suggest that it may be most useful to recruit mainly from community-based 12-step programs when researchers are interested in studying the most motivated and improved subset of 12-step participants. Considering that almost a third of current AA members report entering AA through their own self-motivation (AA, 2007), we believe that more needs to be

understood regarding these members' 12-step attendance patterns, prescribed 12-step behaviors, and how their 12-step involvement relates to their substance use outcomes.

Results showing that the association between 12-step attendance and alcohol abstinent days did not differ by recruitment group indicates that even though participants recruited from community-based AA had higher 12-step attendance rates than all other participants, the relation between their attendance and their amount of alcohol abstinent days was the same as all other participants. This finding may suggest that participants from community-based AA exceeded a threshold of 12-step attendance beyond which they received the same benefit from 12-step attendance as did participants from other recruitment sources. Research on AA affiliation in the first three months after treatment discharge has shown that participants who attend 90 meetings in 90 days do significantly better than do those who attend less (Caldwell & Cutter, 1998). Our findings may suggest that beyond the first three months of recovery (from months 3 to 9), participants who attend 12-step meetings less frequently catch up to participants who always attended 12-step meetings with high frequency in terms of benefit received from 12-step attendance.

Our results also revealed interesting gender differences. We found that men's average 12-step attendance was higher than women's and there were marginally more men than women in the group recruited from community-based AA. These findings may indicate either that men are more likely to participate in 12-step groups than are women, or that men are more willing to participate in studies on 12-step involvement. While several studies have found that men have a higher tendency to seek help for alcohol problems than do women (Timko, Moos, Finney, & Connell, 2002; Weisner, Greenfield & Room, 1995), overall, findings are mixed regarding gender differences in 12-step attendance (cf. Makela, 1994; Ogborne & DeWit, 1999). Future research may help to resolve these mixed findings by making a concerted effort to recruit women and to measure deterrents and barriers to women's participation in 12-step programs.

This study had some limitations that should be considered. First, when assessing 12-step attendance, we did not ask participants to separately report their attendance of different 12-step groups (e.g., Alcoholics Anonymous vs. Narcotics Anonymous). Thus, we could not determine whether each 12-step group had a differential influence on participants' alcohol and substance use. Second, we did not assess the theoretical orientation used in the substance abuse treatment programs that some participants attended. If some participants received 12-step facilitation treatment while others received cognitive-behavioral intervention, this may well have differentially influenced participants' 12-step attendance rates. Third, we excluded individuals with more than four months of lifetime AA involvement from participating. While this may limit our results from generalizing to participants with longer AA histories, we view this exclusion criterion as a strength that allowed us to evaluate the initial mobilization and trajectories of behavior change among individuals new to AA, unconfounded by the accumulation of their prior attempts to change through AA.

In sum, results suggested that participants recruited from community-based AA attended 12-step meetings more frequently and had slightly higher alcohol abstinence rates than did

participants recruited from other sources. Recruitment source did not moderate the association between 12-step attendance and proportion of alcohol abstinent days and this may have been due to a threshold effect in which the 12-step attendance of participants from community-based AA exceeded an amount beyond which they received the same benefit from their attendance as did participants from other recruitment sources. In future research, using diverse recruitment strategies would likely allow researchers to better estimate the true magnitude of the effect of 12-step attendance on substance use and to obtain samples that are more representative of the actual population of 12-step affiliates.

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Table 1

Sample demographic characteristics by recruitment source

	Recruitment Source			
	AA Clubs (<i>n</i> = 27)	Treatment Programs (<i>n</i> = 66)	Word-of-Mouth or Advertisement (<i>n</i> = 33)	Full Sample (<i>N</i> = 126)
% male	74%	48%	51.5%	53.8%
Age in years, <i>M</i> (<i>SD</i>)	36.07 (9.62)	38.00 (8.90)	41.30 (10.75)	38.65 (9.60)
Ethnicity, <i>n</i> (%)				
Hispanic	8 (29.6%)	27 (40.9%)	19 (57.6%)	56 (43.1%)
White	13 (48%)	26 (39.4%)	5 (15.2%)	46 (35.4%)
Other	6 (22.2%)	13 (19.7%)	9 (27.2%)	28 (21.6%)
% Single	85%	71.2%	87.9%	78.5%
% Employed	37%	25.8%	27.3%	28.5%
Median household income	\$10,000	\$9,600	\$10,000	\$10,000
Years of education, <i>M</i> (<i>SD</i>)	13.44 (2.85)	12.53 (3.32)	11.76 (2.42)	12.48 (3.04)

Sample 12-Step. Treatment and Drinking Measures by Recruitment Source: Intake through 9 months

Table 2

12-step and treatment participation	Recruitment Source				Full Sample (<i>N</i> = 126)
	Months	AA Clubs (<i>n</i> = 27)	Treatment Programs (<i>n</i> = 66)	Word-of-Mouth or Advertisement (<i>n</i> = 33)	
Median proportion of days of 12-step attendance	Intake	.22	.07	.05	.08
	0 – 3	.34	.06	.04	.07
	4 – 6	.42	.07	.04	.09
	7 – 9	.12	.07	.03	.07
	<i>Total (Intake – 9 months)</i>	.35	.10	.06	.12
Proportion of treatment days, <i>M</i> (<i>SD</i>)	Intake	.10 (.20)	.10 (.15)	.02 (.04)	.07 (.14)
	0 – 3	.14 (.18)	.15 (.22)	.05 (.12)	.12 (.19)
	4 – 6	.14 (.23)	.14 (.23)	.05 (.10)	.11 (.20)
	7 – 9	.11 (.14)	.12 (.21)	.04 (.09)	.09 (.17)
	<i>Total (Intake – 9 months)</i>	.13 (.12)	.13 (.12)	.04 (.06)	.10 (.11)
Substance use					
Proportion of days abstinent from alcohol, <i>M</i> (<i>SD</i>)	Intake	.62 (.29)	.54 (.30)	.53 (.35)	.56 (.31)
	0 – 3	.85 (.25)	.74 (.32)	.66 (.32)	.72 (.32)
	4 – 6	.81 (.28)	.72 (.32)	.75 (.28)	.74 (.30)
	7 – 9	.80 (.29)	.70 (.34)	.73 (.31)	.72 (.32)
	<i>Total (Intake – 9 months)</i>	.75 (.21)	.67 (.23)	.67 (.25)	.68 (.23)
Drinks per drinking day, <i>M</i> (<i>SD</i>)	Intake	14.38 (11.00)	13.63 (9.37)	14.4 (7.25)	14.00 (9.13)
	0 – 3	9.19 (10.56)	8.51 (11.51)	11.27 (8.52)	9.67 (10.78)
	4 – 6	7.16 (8.14)	7.81 (9.08)	11.50 (8.65)	8.84 (9.05)
	7 – 9	9.73 (10.62)	7.84 (9.47)	8.96 (6.19)	8.60 (8.80)
	<i>Total (Intake – 9 months)</i>	10.37 (8.51)	9.25 (7.25)	11.49 (6.23)	10.25 (7.29)
Proportion of days used most frequently used drug, <i>M</i> (<i>SD</i>)	Intake	.22 (.27)	.34 (.36)	.26 (.32)	.28 (.33)
	0 – 3	.14 (.28)	.25 (.34)	.25 (.33)	.22 (.32)
	4 – 6	.20 (.32)	.26 (.34)	.15 (.30)	.22 (.33)
	7 – 9	.19 (.31)	.24 (.33)	.13 (.25)	.19 (.30)

12-step and treatment participation	Recruitment Source				Full Sample (N = 126)
	Months	AA Clubs (n = 27)	Treatment Programs (n = 66)	Word-of-Mouth or Advertisement (n = 33)	
	Total (Intake – 9 months)	.18 (.26)	.27 (.28)	.19 (.26)	
	Intake	0%	0%	0%	0%
% of participants abstinent from alcohol	0 – 3	25.9%	19.7%	9.1%	24%
	4 – 6	29.6%	21.2%	18.2%	33%
	7 – 9	25.9%	24.2%	18.2%	35%

Note. The intake assessment captured participants' substance use in the previous 90 days.