Predictors and Outcomes of Twelve-Step Sponsorship of Stimulant Users: Secondary Analyses of a Multisite Randomized Clinical Trial

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ABSTRACT. Objective: This secondary data analysis explored predictors and outcomes of having a 12-step sponsor among individuals receiving treatment for stimulant use disorders, inclusive of four types of 12-step groups (Narcotics Anonymous, Alcoholics Anonymous, Cocaine Anonymous, and Crystal Meth Anonymous). **Method:** For a multisite randomized clinical trial, participants ($N = 471$; 59% women) were recruited among adult patients in 10 U.S. community treatment programs. Participants were randomized into treatment as usual (TAU) or a 12-step facilitation (TSF) intervention: Stimulant Abuser Groups to Engage in 12-Step (STAGE-12). Logistic regression analyses explored the extent to which participants obtained sponsors, including the extent to which treatment condition and other predictors (12-step experiences, expectations, and beliefs) were associated with having a sponsor. The relationship between end-of-treatment sponsorship and follow-up substance

use outcomes was also tested. **Results:** Participants were more likely to have a sponsor at the end of treatment and 3-month follow-up, with the STAGE-12 condition having higher sponsorship rates. Twelve-step meeting attendance and literature reading during the treatment period predicted having a sponsor at the end of treatment. Sponsorship at the end of treatment predicted a higher likelihood of abstinence from stimulant use and having no drug-related problems at follow-up. **Conclusions:** This study extends previous research on sponsorship, which has mostly focused on alcohol use disorders, by indicating that sponsorship is associated with positive outcomes for those seeking treatment from stimulant use disorders. It also suggests that sponsorship rates can be improved for those seeking treatment from stimulant use disorders through a short-term TSF intervention. (*J. Stud. Alcohol Drugs*, 78, 287–295, 2017)

MUTUAL SUPPORT GROUPS ARE FREE, readily available, cost-effective resources for supporting long-term recovery from substance use problems (Donovan et al., 2013; Kelly & Yeterian, 2012). In particular, 12-step programs have been created for individuals with multiple substance use problems, including Alcoholics Anonymous (AA), Narcotics Anonymous (NA), Cocaine Anonymous (CA), and Crystal Meth Anonymous (CMA; Donovan & Daley, 2015; Laudet, 2008). Participation in 12-step programs is frequently integrated into voluntary and court-mandated treatment programs for individuals with alcohol and other drug problems (Donovan et al., 2013), including treatment programs for cocaine and methamphetamine dependence (Donovan & Wells, 2007; Weiss et al., 2005).

Moreover, 12-step groups are generally seen as an integral part of an international shift toward a chronic-care model of addiction treatment and recovery (Kelly & Yeterian, 2012; Witbrodt et al., 2012).

Ample research has demonstrated a positive correlation between 12-step participation and substance use recovery outcomes (Kelly et al., 2006; Timko et al., 2006a; Tonigan et al., 1996), even over periods as long as 16 years (Moos & Moos, 2006). Multiple studies have indicated that meeting attendance is positively correlated with achieving and maintaining abstinence from alcohol and other drugs (Connors et al., 2001; Kaskutas, 2009), particularly when attendance is frequent and consistent (Kaskutas et al., 2005; Moos & Moos, 2005), as well as when it is initiated alongside treatment (Fiorentine & Hillhouse, 2000; Kelly & Moos, 2003). Although most research has focused on 12-step participation for individuals with alcohol problems, limited research has demonstrated the benefit of participation for those with drug use disorders (McKay et al., 2001; Weiss et al., 2005).

Social support and sponsorship

One frequently theorized mechanism of the efficacy of 12-step participation is social support, or the “fellowship” (Subbaraman et al., 2011; Young, 2013). Twelve-step participation generally is social in nature, including attending

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meetings, providing service, coordinating with sponsors, and celebrating recovery milestones (Donovan et al., 2013; Young, 2013). Moreover, research has shown that social network influences, beyond simple meeting attendance, have positive benefits for achieving abstinence and reducing substance problems (Bond et al., 2003; Rynes et al., 2013; Tonigan & Rice, 2010). As discussed by Young (2013), attending meetings may be limited in its social benefits because of the anonymous nature of participants and the formal and ritualized nature of meetings. In this regard, the social support that occurs outside of 12-step meetings may be equally if not more important. This explanation is consistent with a growing body of research that has demonstrated the importance of one's social environment in regard to substance use problems (Young, 2013).

One well-known aspect of informal 12-step social support is sponsorship, in which a 12-step participant in long-term stable recovery voluntarily serves as a role model and supportive guide to a fellow participant in earlier recovery (Kelly et al., 2016; Whelan et al., 2009; Young, 2013). A qualitative analysis showed three broad roles of AA sponsors: encouraging sponsees to work the 12 steps, providing emotional and practical support, and sharing personal recovery stories with sponsees (Whelan et al., 2009). Sponsorship can greatly deepen the social network benefits of 12-step participation, with some sponsors being available 24 hours as needed (Kelly et al., 2016; Zetmore et al., 2013); in many cases, sponsored relationships last for years or even decades (Crape et al., 2002). Research has generally shown that having a sponsor is associated with greater abstinence and recovery outcomes (Kelly et al., 2016), especially for those who have recently affiliated with 12-step groups (Weiss et al., 2000). These benefits have been shown to be greater than benefits resulting from mere meeting attendance (Crape et al., 2002; Witbrodt et al., 2012). In Young's (2013) exploratory analysis comparing sponsored versus unsponsored individuals in recovery from alcohol, those with sponsors were more likely to report having an AA home group, a higher degree of surrender to a Higher Power, and greater participation in AA activities.

Study overview

Because previous studies on 12-step sponsorship have focused almost exclusively on AA and individuals with alcohol problems, little is known about predictors and outcomes of sponsorship in other 12-step groups and among those with drug use disorders. As a result, it is unclear the extent to which sponsorship promotes recovery for those with drug use problems. Possible reasons for sponsorship outcomes differing for those with drug use disorders, relative to alcohol use disorder, include less availability of drug-specific mutual support groups (Weiss et al., 2000) and higher potential for stigma and legal problems associated with drug use.

The present study is innovative in its focus on predictors and outcomes of 12-step sponsorship for individuals with stimulant use disorders (primarily cocaine and methamphetamine use disorders), and inclusive of four types of 12-step recovery groups (NA, AA, CA, and CMA). For this exploratory study, we conducted secondary analyses using data from a randomized clinical trial of a 12-step facilitation (TSF) intervention. TSF is a manualized evidence-based treatment that has been demonstrated to increase participation in 12-step groups and result in greater abstinence and recovery outcomes (Donovan & Daley, 2015; Nowinski et al., 1999). For this trial, TSF was adapted for patients with primary stimulant use disorders (Stimulant Abuser Groups to Engage in 12-Step, or STAGE-12) and was compared with treatment as usual (TAU; see Daley et al., 2011; Donovan et al., 2013). For our secondary analyses, we explored the following research questions: (1) To what extent do patients with stimulant use disorders have and obtain sponsors through the four 12-step groups (NA, AA, CA, and CMA)? (2) Does STAGE-12 increase rates of having and obtaining a sponsor more than does TAU? (3) Do prior 12-step experiences, expectations, and beliefs predict changes in 12-step sponsorship? (4) Is there an association between sponsorship and 12-step participation during treatment? (5) Does having a sponsor during treatment predict substance use outcomes at follow-up?

Method

The clinical trial was approved by Institutional Review Boards from the University of Washington and each participating university and community treatment program. The trial was also overseen by an independent Data and Safety Monitoring Board.

Treatment conditions

Data for these analyses were collected as part of a multisite randomized clinical trial of STAGE-12, an 8-week TSF intervention integrated into intensive outpatient treatment programs for stimulant use disorders (Daley et al., 2011; Donovan et al., 2013). This trial was funded through the National Institute on Drug Abuse's National Drug Abuse Treatment Clinical Trials Network, in partnership with 10 community treatment programs in the Pacific, Southern, and Midwestern United States. After a baseline assessment, participants were randomized to one of two treatment conditions. The control condition ($n = 237$) was TAU at each community treatment program, consisting of a minimum of 5–15 weekly hours of outpatient treatment. The experimental condition, STAGE-12 ($n = 234$), consisted of five 90-minute open-enrolling group sessions and three complementary individual therapy sessions. STAGE-12 sessions substituted for five group and three in-

dividual TAU sessions. STAGE-12 group sessions provided a systematic introduction to 12-step programs, facilitated acceptance and surrender of addiction, and encouraged 12-step participation.

Sponsorship was addressed in each group session through clinicians following up with patients about their efforts to secure a sponsor since the last session. In addition, sponsorship was a topic in one of the five STAGE-12 groups, with content including the history and importance of sponsorship, sponsor roles, differences between sponsors and clinicians, strategies for finding a sponsor, and guidelines for choosing a sponsor. STAGE-12 individual sessions focused primarily on an intensive referral procedure, including linking participants to a 12-step volunteer (a temporary “buddy”), encouraging participants to secure a sponsor, providing participants with a list of potential sponsors, and discussing experiences and barriers with 12-step participation (Timko et al., 2006b). Participants in both conditions were allowed to attend 12-step meetings and have a sponsor, but only the STAGE-12 condition provided a systematic introduction and intensive referral program. (For additional details about STAGE-12 and the clinical trial, see Daley et al., 2011, and Donovan et al., 2013.)

Participants

Participants ($N = 471$) were adults recruited upon admission to a 5- to 8-week intensive outpatient program of specialty substance use disorder treatment at one of the 10 community treatment programs. Inclusion criteria were reported use of illicit stimulant drugs within the past 60 days (or within 30 days before incarceration for those who were incarcerated within the past 60 days) and a current diagnosis (past 6 months) of stimulant abuse or dependence, based on the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV; American Psychiatric Association, 1994). Most participants met DSM-IV criteria for cocaine dependence ($n = 338$) and/or methamphetamine dependence ($n = 170$), including 45 participants who met criteria for both.

Patients were excluded if they sought detoxification only; needed detoxification for opioid withdrawal; were enrolled in a residential, inpatient, or methadone maintenance treatment program; had a medical or psychiatric condition that would render participation to be hazardous (as determined by clinical staff); were incarcerated for more than 60 days in the 90 days before the baseline interview; or had pending legal action that would prevent full participation. Follow-up completion rates were 75.2% ($n = 354$) at the 8-week (end-of-treatment) assessment and 69.9% ($n = 329$) at the 3-month follow-up assessment (approximately 1 month post-treatment). See Table 1 for demographic differences among the sample. (For additional details about participant recruitment and demographics, see Donovan et al., 2013.)

TABLE 1. Participant baseline characteristics

Demographic variable	<i>n</i> (%)	<i>M</i> (<i>SD</i>)
Gender		
Female	277 (58.8)	
Male	194 (41.2)	
Age, in years		38.35 (9.71)
Race		
White	220 (46.7)	
Black	170 (36.1)	
Multiracial	48 (10.2)	
American Indian/Alaska Native	8 (1.7)	
Asian	5 (1.1)	
Native Hawaiian/Pacific Islander	4 (0.9)	
Other	13 (2.8)	
Did not answer	3 (0.6)	
Ethnicity		
Non-Hispanic	439 (93.6)	
Hispanic	30 (6.4)	
Education, in years		12.11 (1.62)
Longest job, in years		4.26 (4.40)
Current residence, years		2.55 (5.70)
Primary substance problem		
Cocaine	156 (33.1)	
Concurrent alcohol/drug	139 (29.5)	
Methamphetamine/amphetamine	102 (21.7)	
Other drug(s)	58 (12.3)	
Alcohol	16 (3.4)	

Note: Demographic information collected at baseline of clinical trial ($N = 471$), using a standard Clinical Trials Network demographics form and a section of the Addiction Severity Index–Lite.

Measures

Demographics (baseline). Demographic information was collected at baseline using a standard Clinical Trials Network demographics form and a section of the Addiction Severity Index–Lite (ASI-Lite; McLellan et al., 1992). Variables included age, gender, race, ethnicity, years of education, years at current residence, years at longest job, and primary substance use category. (For more information, see Donovan et al., 2013.)

Twelve-step experiences, expectations, and readiness (baseline). Participants' 12-step experiences, expectations, and readiness were measured through three baseline self-report surveys. First, the Twelve-Step Experiences and Expectations scale, a measure developed for use in the parent project (Donovan et al., 2013), assessed prior participation with a mutual support group (yes/no), likelihood of support group participation during the clinical trial (1–4 Likert-type scale; 1 = *not at all likely*, 4 = *extremely likely*), and beliefs about how helpful this participation would be (1–4 Likert-type scale; 1 = *not at all helpful*, 4 = *extremely helpful*).

Second, the Survey of Readiness for Alcoholics Anonymous Participation (SYRAAP) assessed expectations and readiness for 12-step participation (Kingree et al., 2006, 2007). The original scale was modified to include NA, CA, and CMA (in addition to AA) as the 12-step groups to be considered in responding. The scale consists of three 5-item subscales pertaining to the respondent's self-reported sever-

ity of substance use problems (Severity), perceived benefits from 12-step group participation (Perceived Benefits), and perceived barriers to 12-step participation (Perceived Barriers). Each item is rated on a 1–5 Likert scale (1 = *strongly disagree*, 5 = *strongly agree*). The original SYRAAP has demonstrated a high degree of internal validity and construct validity and has been predictive of subsequent AA participation (Kingree et al., 2006, 2007). Subscales for our revised measure had high internal consistency reliability for this sample (α values: Severity = .78; Benefits = .83; Barriers = .71).

Third, the Short Understanding of Substance Abuse Scale (SUSS) is a 19-item instrument that assessed participants' beliefs about addiction etiology (Humphreys et al., 1996). Responses were rated on a 1–5 Likert scale (1 = *strongly disagree*, 5 = *strongly agree*) and were scored according to three subscales characterizing etiological models of addiction: Disease, Psychosocial, and Eclectic. The three-factor structure of the SUSS has been validated through confirmatory factor analysis, and it has been shown to have internal consistency reliability for all three subscales (Humphreys et al., 1996). The Disease subscale, which would reflect agreement with an addiction etiology similar to what is commonly endorsed in 12-step groups, was used as a variable for this article.

Twelve-step participation outcomes. Twelve-step participation outcomes consisted of items from the Self-Help Activities Questionnaire (SHAQ), administered at each study assessment interval. For the parent study (Donovan et al., 2013), the SHAQ was modified from the Weekly Self-Help Questionnaire, a self-report measure of 12-step attendance, participation, and sponsorship developed for the National Institute on Drug Abuse Collaborative Cocaine Treatment Study (Weiss et al., 1996). The primary modifications were changing the time frame of reporting (from the previous week to the past 30 days) and adding CMA as a mutual support group. Our analyses included the following items: (a) presence/absence of a 12-step sponsor (for NA, AA, CA, and CMA) and (b) number of days involved in various 12-step activities at baseline and the end of treatment (i.e., attending meetings, meeting with other 12-step members outside of meetings, receiving a phone call from another member, assisting with duties at a meeting, speaking at a meeting, and reading 12-step literature for at least 5 minutes). In addition, sponsorship items were used to determine whether participants without a sponsor at baseline had gained a sponsor during treatment or by the 3-month follow-up.

Substance use outcomes. Substance use outcomes were measured using items on the ASI-Lite (Cacciola et al., 2007), administered at baseline and the 3-month follow-up. Items for this analysis consist of the number of days of illicit stimulant use in the past 30 days, as well as the Drug Use Composite and Alcohol Use Composite scores. Composite scores ranged between 0 (*no use and no endorsement of any*

problems) and 1 (*maximal endorsement of all problems*), based on self-reported use, problem severity, and perceived need for treatment for the past 30 days. Because the aforementioned items and composite scores resulted in high zero inflation for this study, they were each dichotomized for our analyses as categorical variables (0 = *no reported problems and no use*; 1 = *any reported problems and/or any use*), which was consistent with the treatment program goal of abstinence.

Analysis

To describe the extent to which participants have and obtain sponsors, we conducted descriptive analyses on sponsorship rates (for the previous month) for participants at baseline, at the end of treatment, and at the 3-month follow-up, including rates for each sponsorship type (i.e., NA, AA, CA, and CMA). Remaining analyses used logistic regression and pertained to sponsorship across all four sponsorship types. First, we analyzed between-condition differences in sponsorship rates for STAGE-12 and TAU at the end of treatment and follow-up (controlling for baseline sponsorship), including a separate analysis limited to those who did not have a sponsor at baseline. Second, we analyzed whether reported 12-step readiness, experiences, expectations, and beliefs predicted sponsorship at both baseline and the end of treatment. Third, we analyzed the association between having a sponsor and participating in 12-step activities during the treatment period. Finally, we analyzed the degree to which end-of-treatment sponsorship predicted substance use outcomes at the 3-month follow up (which allows for a period of posttreatment time in which individuals may be using sponsors in the community).

For all analyses, we scaled nonbinary variables as z scores to facilitate interpretation of effect sizes; binary predictors were coded with 0 indicating the variable's absence (e.g., *no sponsor, no drug use*) and 1 indicating its presence (e.g., *has sponsor, any drug use*). Multiple imputation was used to reduce bias due to missing data and to prevent case-wise deletion of subjects with missing values (see Hallgren et al., 2016; van Buuren & Groothuis-Oudshoorn, 2011). An α level of .05 was used for all significance testing.

Results

Twelve-step sponsorship rates

Table 2 indicates past-month sponsorship rates at baseline, end of treatment (8 weeks), and follow-up (3 months) by each 12-step type (NA, AA, CA, and CMA). Sponsorship increased from 38.9% of participants at baseline to 64.7% at the end of treatment, with 61.3% having sponsors at follow-up. At each period, the majority of sponsorship was through NA and AA, with a small percentage through CA and CMA.

TABLE 2. Percentage of participants with 12-step sponsors (past 30 days)

Sponsorship type	Baseline <i>n</i> (%) ^a	Week 8 <i>n</i> (%) ^a	Month 3 <i>N</i> (%) ^a
Narcotics Anonymous (NA)	126 (26.8)	157 (45.1)	127 (38.7)
Alcoholics Anonymous (AA)	96 (20.4)	115 (32.7)	102 (31.0)
Cocaine Anonymous (CA)	16 (3.4)	13 (3.8)	14 (4.3)
Crystal Meth Anonymous (CMA)	7 (1.5)	7 (2.0)	2 (0.6)
One or more of above	183 (38.9)	225 (64.7)	201 (61.3)

Notes: Results based on Self-Help Activities Questionnaire, which assessed whether participants had sponsors (in the past 30 days) from 12-step groups at baseline, the end of treatment (Week 8), and follow-up (Month 3). Participants could report more than one sponsorship type per assessment. ^aPercentages based on responses from 470 (Baseline), 348 (Week 8), and 328 (Month 3) participants. (Missing data due to nonresponse for 1, 6, and 1 participant[s], respectively, at each interval.)

Some participants reported being sponsored through more than one 12-step type: 48 participants (10.2%) at baseline, 57 (25.3%) at the end of treatment, and 34 (16.9%) at follow-up. Of the 288 participants without sponsors at baseline, 84 (29.2%) had sponsors by the end of treatment; at follow-up, 87 participants (30.2%) had sponsors. Of the 183 participants with sponsors at baseline, 15 (8.2%) did not have sponsors by the end of treatment; at follow-up, 24 (13.1%) did not have sponsors. No statistically significant differences were detected for baseline sponsorship rates among categorical demographic variables and treatment condition; among continuous variables, participants with sponsors at baseline were more than 2 years older on average ($M = 39.62$, $SD = 9.36$) than participants without sponsors at baseline ($M = 37.54$, $SD = 9.87$), $t(468) = 2.27$, $p < .05$.

Treatment condition differences

Treatment condition groups, which did not differ in sponsorship rates at baseline, differed in end-of-treatment and follow-up sponsorship rates. As shown in Table 3, a significantly higher percentage of STAGE-12 participants had a sponsor at the end of treatment and at follow-up compared with TAU participants. The same pattern held for an analysis limited to those who did not have a sponsor at baseline: of the 87 STAGE-12 participants without sponsors at baseline, 55.2% ($n = 48$) had a sponsor by the end of treatment, in

comparison to 32.4% ($n = 36$) of the 111 TAU participants who did not have a sponsor at baseline (odds ratio [OR] = 2.19, $p = .007$). Likewise, 58.1% ($n = 50$) of STAGE-12 participants without sponsors at baseline had a sponsor at the 3-month follow-up versus 35.2% ($n = 37$) of TAU participants without a sponsor at baseline (OR = 2.18, $p = .007$).

Twelve-step experiences, expectations, and readiness

Associations of baseline 12-step experiences, expectations, and readiness with sponsorship (at baseline and the end of treatment) are presented in the upper half of Table 4. Higher perceived 12-step benefits and disease model beliefs and lower perceived 12-step barriers at baseline were concurrently associated with greater odds of having a sponsor at baseline. None of these variables, however, predicted posttreatment sponsorship when we controlled for baseline sponsorship and treatment assignment.

Twelve-step participation outcomes

Associations of 12-step involvement during treatment with sponsorship at the end of treatment are presented in the lower half of Table 4. After we controlled for baseline sponsorship and treatment assignment, having a sponsor at the end of treatment was positively predicted by 12-step meeting attendance and 12-step literature reading. ORs for these stan-

TABLE 3. Twelve-step sponsorship rates by treatment condition (past 30 days)

Variable	TAU <i>n</i> (%) ^a	STAGE-12 <i>n</i> (%) ^b	OR	[95% CI]	<i>p</i>
Sponsor at baseline	87 (36.7)	96 (41.2)	1.21	[0.84, 1.76]	.31
Sponsor at Week 8	102 (54.8)	123 (73.2)	2.06	[1.28, 3.30]	.003
Sponsor at Month 3	91 (52.0)	110 (71.4)	2.07	[1.31, 3.27]	.002

Notes: Results based on Self-Help Activities Questionnaire, which assessed whether participants had sponsors (in the past 30 days) at baseline, the end of treatment (8 weeks), and a 3-month follow-up. Odds ratios (OR) and *p* values indicate differences between treatment as usual (TAU) and STAGE-12 at each time point (Week 8 and Month 3) analyses controlled for baseline sponsorship). STAGE-12 = Stimulant Abuser Groups to Engage in 12-Step; CI = confidence interval. ^aPercentages based on responses from 233 (Baseline), 186 (Week 8), and 175 (Month 3) participants; ^bpercentages based on responses from 237 (Baseline), 168 (Week 8), and 154 (Month 3) participants.

TABLE 4. Baseline and within-treatment predictors of having a 12-step sponsor (past 30 days)

Variable	Baseline sponsorship			Week-8 sponsorship		
	OR	[95% CI]	<i>p</i>	OR	[95% CI]	<i>p</i>
Baseline predictors						
Perceived 12-step barriers (SYRAAP)	0.71	[0.55, 0.91]	.007	0.87	[0.68, 1.12]	.27
Perceived 12-step benefits (SYRAAP)	1.66	[1.21, 2.29]	.002	0.95	[0.70, 1.30]	.74
Perceived substance use severity (SYRAAP)	1.35	[0.98, 1.87]	.07	0.95	[0.70, 1.28]	.72
Disease model beliefs (SUSS)	1.43	[1.09, 1.86]	.009	1.17	[0.85, 1.60]	.33
Any past mutual support group involvement (TSEE)	1.44	[0.93, 2.22]	.10	1.21	[0.74, 1.97]	.45
Likelihood of future mutual support group involvement (TSEE)	1.19	[0.88, 1.60]	.26	1.04	[0.75, 1.44]	.82
Perceived future helpfulness of mutual support group (TSEE)	0.79	[0.58, 1.09]	.15	1.24	[0.90, 1.71]	.20
Sponsor at baseline				7.48	[3.91, 14.29]	<.001
STAGE-12 treatment randomization				2.17	[1.34, 3.51]	.002
Within-treatment predictors						
Days attended 12-step meetings (SHAQ)				1.74	[1.11, 2.72]	.02
Days met with 12-step member (SHAQ)				1.34	[0.86, 2.07]	.19
Days received phone call from 12-step member (SHAQ)				0.98	[0.64, 1.50]	.92
Days assisted with duties at 12-step meetings (SHAQ)				1.32	[0.57, 3.08]	.51
Days spoke at 12-step meetings (SHAQ)				1.95	[0.81, 4.71]	.13
Days read from 12-step literature (SHAQ)				1.51	[1.03, 2.22]	.03
Sponsor at baseline				6.16	[3.08, 12.31]	<.001
STAGE-12 treatment randomization				1.93	[1.12, 3.33]	.02

Notes: Sponsorship results based on Self-Help Activities Questionnaire (SHAQ), which assessed whether participants ($N = 471$) had sponsors (in the past 30 days) at baseline and the end of treatment (8 weeks). Odds ratios (OR) were estimated in logistic multiple regression to account for correlations among predictors. Sponsorship at Week 8 was predicted in two regression models, each containing only baseline or within-treatment predictors plus sponsorship at baseline. CI = confidence interval; SYRAAP = Survey of Readiness for Alcoholics Anonymous Participation; SUSS = Short Understanding of Substance Abuse Scale; TSEE = Twelve-Step Experiences and Expectations; STAGE-12 = Stimulant Abuser Groups to Engage in 12-Step. Statistically significant effects ($p < .05$) are marked with **bold**.

standardized predictors can be interpreted to indicate that a 1 *SD* increase in the number of days attending 12-step meetings and reading 12-step literature was independently associated with a 1.74-fold and 1.51-fold increase, respectively, in the odds of having a sponsor at the end of treatment. Other measures of 12-step involvement were not independently associated with the odds of having a sponsor at the end of treatment.

Substance use outcomes

Associations between sponsorship at the end of treatment and substance use outcomes at follow-up (controlling for baseline drug or alcohol use) are presented in Table 5. Participants with sponsors were less likely at follow-up to report any drug use or problems in the past month, based on dichotomized measures. Specifically, a lower percentage of sponsored participants reported some drug use or associated problems (vs. none), based on the ASI-Lite Drug Use Composite score and reported stimulant use. This latter outcome was based on those who reported any use of cocaine, methamphetamines, and/or amphetamines in the past 30 days; these drug categories were combined because the goal of treatment was to reduce stimulant drug use and because of low statistical power to detect potential effects within each specific drug class. In terms of alcohol use, although sponsored participants had lower nominal rates than unsponsored participants for alcohol use/severity, this difference was not statistically significant. Similar patterns of results were obtained when these analyses were restricted to participants

reporting any use of each respective substance at baseline and when analyses were performed using nonbinary ASI-Lite composites. There also were no significant Treatment Condition $\times$ Posttreatment Sponsor interactions predicting substance use, suggesting that the effects of sponsorship on substance use were not different between the two treatment conditions ($p > .10$).

Discussion

We explored predictors and outcomes of 12-step sponsorship using data from a multisite randomized clinical trial of 471 patients receiving intensive outpatient treatment for stimulant use disorders. Participants were more likely to have a sponsor at the end of treatment (8 weeks) as well as at a 3-month follow-up, with participants in the TSF treatment condition (STAGE-12) having higher sponsorship and sponsor gain rates than those in the TAU condition. A plausible explanation for these treatment condition differences is STAGE-12's greater attention to TSF, especially via individualized counseling sessions that included addressing barriers to 12-step participation, linking participants with a temporary "buddy," and providing patients with a list of potential sponsors. Given that baseline sponsorship rates did not differ between the two conditions, this study suggests that sponsorship rates can be systematically improved through a short-term TSF treatment protocol such as STAGE-12.

This study also extends and generalizes previous research on sponsorship for alcohol use disorders, indicating that hav-

TABLE 5. Substance use outcomes (3-month follow-up) for unsponsored and sponsored participants (end of treatment)

Variable	Unsponsored (<i>n</i> = 109) <i>n</i> (%)	Sponsored (<i>n</i> = 195) <i>n</i> (%)	OR	[95% CI]	<i>p</i>
Any reported drug use/problems ^a	83 (76.1)	107 (54.9)	0.43	[0.25, 0.72]	.002
Any reported alcohol use/problems ^b	46 (42.2)	57 (29.4)	0.67	[0.41, 1.09]	.11
Any stimulant use ^c	42 (38.5)	39 (20.0)	0.52	[0.31, 0.87]	.01
Any cocaine use	29 (26.6)	29 (14.9)			
Any methamphetamine use	12 (11.0)	11 (5.6)			
Any amphetamine use	2 (0.02)	0 (0.0)			

Notes: Sponsorship results based on Self-Help Activities Questionnaire, which assessed whether participants had sponsors (in the past 30 days) at the end of treatment (8 weeks). Substance use outcomes were assessed using the Addiction Severity Index–Lite (ASI-Lite) administered at the 3-month follow-up. Odds ratios (OR) control for baseline drug use/problems (based on ASI-Lite Drug Use Composite). CI = confidence interval. ^aBased on dichotomization of ASI-Lite Drug Composite (past 30 days); ^bbased on dichotomization of ASI-Lite Alcohol Composite (past 30 days); ^cbased on dichotomization of reported cocaine, methamphetamine, and/or amphetamine use in the past 30 days (ASI-Lite).

ing a sponsor is associated with positive outcomes for those seeking treatment from stimulant use disorders. Participants who had a sponsor at the end of treatment were more likely to have attended 12-step meetings and read from 12-step literature during treatment. These results are congruent with previous research focused on AA and alcohol use disorders, in which sponsored AA members were more likely to attend meetings and read AA literature (Young, 2013). We cannot infer from our study the extent to which sponsorship was a cause versus a consequence of greater 12-step participation; a social network explanation of 12-step recovery would suggest bidirectional causality. Importantly, participants who had a sponsor at the end of treatment had less subsequent drug use and fewer problems at follow-up—consistent with previous research on the relationship between sponsorship and alcohol use (Kelly et al., 2016; Tonigan & Rice, 2010).

In addition, this study suggests that sponsorship may be valuable even when clients do not have positive prior experiences, expectations, and beliefs about 12-step involvement. Although certain individual factors (perception of benefits and barriers of 12-step participation; disease model beliefs) were associated with having a sponsor at baseline, these and other factors were not predictive of having a sponsor at the end of treatment (controlling for baseline sponsor and treatment condition). A clinical implication—consistent with social support being a primary mechanism of 12-step involvement—is that a TSF intervention may be beneficial in helping patients with stimulant use disorders to gain sponsors, even if they have limited prior 12-step experience or lack beliefs that are obviously consistent with 12-step philosophy (see Weiss et al., 2000, concerning a similar implication for 12-step meeting attendance among stimulant users). The importance of this implication is supported by previous research (in the context of AA) indicating that having a sponsor has greater positive outcomes for those who are recently initiated to 12-step fellowship (Tonigan & Rice, 2010).

Although this study was focused on stimulant use, participants were much more likely to receive sponsors through NA and AA than through CA or CMA—consistent with a previous analysis indicating infrequent CA and CMA meeting attendance among this sample (Hatch-Maillette et al., 2016). A similar result was found by Weiss et al. (2000) in treatment research with cocaine use disorder patients, in which NA and AA were the most common 12-step group types used, whereas CA was less frequently used. It is unclear the extent to which this finding reflects genuine participant preferences, as CA and CMA have much smaller memberships generally than do NA and AA (Laudet, 2008). Given these findings and the sparse research literature on CA and CMA use, we recommend future research on the availability, accessibility, and use of CA and CMA groups for individuals with primary stimulant use disorders, as well as these individuals' perspectives on using NA, AA, or other more available 12-step groups.

Several limitations of this study should be noted. First, data are limited to participants' self-report; this limitation is attenuated due to key outcomes being based on widely used measures that have been validated for substance use disorder treatment patients. Second, it is unclear the extent to which results generalize to the broader stimulant use disorder population. The study was limited to individuals who had already initiated intensive outpatient substance use disorder treatment in U.S. community treatment programs. Stimulant users who are not in treatment may have lower rates of sponsorship and may also have different outcomes as a result of sponsorship. It also is possible that the ratio of 12-step group types is different across the United States and internationally than was the case for the regional areas of this study, which may affect utilization of those groups.

Third, the community treatment programs in this study were already amenable to a 12-step philosophy (as is typical in the United States; Fletcher, 2013), which may suggest that participants were positively inclined toward 12-step partici-

pation and sponsorship from the outset. Fourth, beyond the effect of the treatment condition (STAGE-12 vs. TSF), this study design does not allow us to make causal inferences about the relationship between sponsorship and other factors. Therefore, some caution should be used in interpreting these results, and we encourage future research to replicate these findings in studies with diverse samples. Finally, the specific roles that sponsors played were not assessed. It is possible that certain roles had more impact than others. Therefore, we recommend that future research on mechanisms of sponsorship be based on roles identified in the exploratory study by Whelan et al. (2009).

This study advances research on 12-step sponsorship into the context of stimulant use disorders and is inclusive of NA, AA, CA, and CMA fellowships. Its results indicate that a short-term TSF treatment protocol for stimulant use disorders (STAGE-12) increased the likelihood of sponsorship in comparison with TAU, and that sponsorship was associated with 12-step participation and reduced drug use and severity.

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