Attachment Avoidance and Anxiety as Predictors of 12-Step Group Engagement*

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ABSTRACT. Objective: Twelve-step mutual help groups such as Alcoholics Anonymous (AA) rely heavily on social interactions and support to reduce drinking, but little is known about how individual differences in social behavior tendencies, such as adult attachment, affect 12-step group engagement and resulting benefits. This prospective study investigated relationships between the anxiety and avoidance dimensions of adult attachment and subsequent 12-step meeting attendance, program behaviors, sponsorship, and alcohol use. **Method:** Early 12-step group affiliates (*N* = 253) were recruited from community-based AA and from outpatient treatment. Participants completed baseline interviews that included the Relationship Questionnaire, measures of motivation and professional treatment, and measures of 12-step meeting attendance, practices, and sponsorship. Follow-up interviews were conducted at 3, 6, 9, 12, 18, and 24 months. **Results:** At baseline, participants reported elevated attachment anxiety relative to a college population. Lagged analyses demonstrated that, as predicted, high attachment avoidance was related to lower rates of 12-step meeting attendance, practice of behaviors prescribed by 12-step organizations, and lower probability of acquiring a sponsor. Attachment anxiety did not predict any of these aspects of subsequent 12-step group engagement. Contrary to predictions, baseline attachment avoidance did not moderate the relationship between early sponsorship and alcohol use. **Conclusions:** Findings support the hypothesis that social demands of behaviors prescribed by 12-step groups may deter high-avoidance individuals from fully engaging in them. Perhaps because of instability in attachment avoidance in this population, however, baseline attachment avoidance did not predict drinking outcomes or moderate sponsor benefits. (*J. Stud. Alcohol Drugs, 72,* 000–000, 2011)

ALCOHOLICS ANONYMOUS (AA) IS THE MOST popular community-based mutual help organization for alcohol use disorders in the United States (Kelly and Yeterian, 2008) and has demonstrated effectiveness in reducing alcohol use (Finney et al., 1999; Kelly et al., 2006; Timko et al., 2000; Tonigan et al., 1996b). The 12-step program at the core of AA has been extended to other popular organizations such as Narcotics Anonymous. Benefits of 12-step group engagement are explained by a combination of 12-step-specific mechanisms (Kelly et al., 2010b; Robinson et al., 2007) and common change mechanisms (e.g., Forcehimes and Tonigan, 2008). Problem drinkers do not respond uniformly to 12-step groups; however, dropout rates are high (e.g., Kelly and Moos, 2003; Thurstin et al., 1987), and a substantial proportion of those who do attend meetings nevertheless report continued drinking and illicit drug use (e.g., Tonigan and Rice, 2010). These findings highlight the importance of identifying the characteristics of problem drinkers that predict 12-step group affiliation and degree of engagement.

Few consistent predictors of affiliation with 12-step organizations have been identified. The most robust finding has been the positive association between alcohol problem severity and group engagement: greater alcohol problem severity predicted both initiation of group affiliation (Emrick et al., 1993; Tonigan et al., 2006) and lower rates of dropout (Tonigan et al., 2006). Demographic characteristics, on the other hand, consistently proved to be poor predictors of attendance: similar rates of affiliation and attendance were found between treatment-seeking adults and adolescents referred to 12-step groups (Kelly et al., 2010a), between men and women (Hillhouse and Fiorentine, 2001; Witbrodt and Romelsjö, 2010), and among ethnic and economic groups (Hillhouse and Fiorentine, 2001; Tonigan et al., 1998).

Variation in psychological traits is rarely considered as a predictor of 12-step group engagement. One recent exception is the work of Book and colleagues (2009), who reasoned that social features of 12-step groups should present particular challenges for socially anxious problem drinkers. They found that AA and Narcotics Anonymous participants high in social anxiety were indeed more likely to report that "shyness" affected their attendance and willingness to ask to be sponsored. Women with social phobia were also substantially less likely to acquire a 12-step sponsor during 12-step facilitation therapy, compared with nonphobic women (Tonigan et al., 2010). The present study continues the search for predictors of 12-step group affiliation by advancing a hypothesis of individual differences in response to the social demands inherent in prescribed 12-step practices. This hypothesis applies attachment theory (Bowlby, 1969; Griffin and Bartholomew, 1994b; Hazan and Shaver, 1987) to describe how individuals will differ in their response to

these social demands and to thereby predict which individuals will attend and engage with 12-step groups.

Measurement of individual differences in social attachment behavior is rooted in Bowlby's (1969) attachment theory. Bowlby proposed that individuals develop mental models of the social world based on their relationships with others, such as caregivers, and that these models produce expectations about the reliability and benefits of close relationships throughout life. Mental attachment models are hypothesized to determine whether individuals avoid or experience anxiety about close social relationships (Griffin and Bartholomew, 1994b). Behavior to which attachment theory has been applied ranges from infants' responses to the Strange Situation protocol (Ainsworth et al., 1978) to adults' capacity for intimacy in romantic relationships (Hazan and Shaver, 1987).

Although there is a long tradition of viewing attachment traits in categorical terms, continuous dimensions better account for variability in self-report adult attachment scales (Fraley and Waller, 1998; Griffin and Bartholomew, 1994a). Specifically, factor analysis (Brennan et al., 1998) and multitrait–multimethod comparisons (Griffin and Bartholomew, 1994b) support a model with two dimensions, commonly referred to as attachment avoidance and attachment anxiety. *Attachment avoidance* describes overt behavior: high levels of attachment avoidance are associated with a lack of close relationships, whether this is paired with anxiety about relationships (i.e., the "fearful avoidant" style) or not (i.e., the "dismissing avoidant" style). *Attachment anxiety* describes individuals' expectations and feelings about close relationships with others, rather than overt behavior. High attachment anxiety can be paired with avoidant behavior (i.e., the "fearful avoidant" style) or instead with a strong dependency on others and preoccupation with maintaining close relationships (i.e., the "preoccupied" style); in either case, individuals expect a high risk of rejection by others (Bartholomew and Horowitz, 1991).

Very little research has assessed how engagement with the practices prescribed by 12-step groups may be affected by these attachment differences. Process studies of group counseling settings provide suggestive results. Shechtman and Rybko (2004) found that self-reported attachment avoidance and anxiety each predicted lower disclosure of private information to the group in an initial meeting. Dismissing attachment (i.e., low anxiety paired with high avoidance) also predicted lower attendance and more negative attitudes about the group in a university transition facilitation program (Ames et al., 2011). Finally, attachment avoidance (but not attachment anxiety) has been reported to predict fears of vulnerability in a group psychotherapy setting, including fear that group participation would result in criticism and humiliation (Marmarosh et al., 2009).

Prescribed practices in 12-step mutual help organizations can be categorized into program and fellowship behaviors.

Both categories include social interactions that may be aversive or difficult for individuals with high attachment anxiety or avoidance. Behaviors associated with the 12-step program are described most succinctly in the 12 steps (AA World Services, 2002; Borkman, 2008). As examples, members are expected to disclose, to another person, a detailed personal history of wrongdoing (Step 5); to acknowledge recent harms done to others (Step 9); to promptly admit any wrongs done to another person (Step 10); and to carry the messages of 12-step beliefs and recovery to other alcoholics (Step 12). In contrast, 12-step fellowship participation includes the broad array of behaviors associated with membership in a social organization (AA World Services, 2002), such as attending social functions, attending 12-step meetings, preparing spaces for meetings, calling other members for help, and answering telephone hotlines. Acquisition of a 12-step sponsor represents the intersection of 12-step program and fellowship domains (Tonigan and Rice, 2010). Sponsorship constitutes a particularly intimate interpersonal relationship, and in addition to providing emotional support outside of group meetings, it is intended to facilitate both members' completion of the 12 steps (AA World Services, 2005; Whelan et al., 2009).

This study tested several theoretically grounded hypotheses, organized into three aims, about the roles social attachment avoidance and anxiety may serve in predicting 12-step group engagement and drinking. Aim 1 investigated whether attachment traits differed between early 12-step group affiliates and a broader population sample. Individuals with substance use disorders often report elevated attachment anxiety and/or avoidance (Caspers et al., 2006; Molnar et al., 2010). Because attachment anxiety or avoidance may also reduce the probability that an individual will become affiliated with a mutual aid group, however, we made no a priori prediction about the overall attachment differences between 12-step affiliates and the broader sample. Relatedly, we sought to document any changes in participants' attachment traits between baseline and a 12-month interview. One previous study found that reports of changes away from high-avoidance and high-anxiety attachment styles among 12-step group affiliates were related to performing program behaviors (i.e., the 12 steps), having a 12-step sponsor, and talking to group members outside of meetings, but not to frequency of meeting attendance (Smith and Tonigan, 2009). However, this study relied on retrospective self-reports of similarity to attachment style prototypes, which are not likely to be valid measures of past attachment traits (Kirkpatrick and Hazan, 1994; Scharfe and Bartholomew, 1998).

Aim 2 investigated the effects of attachment avoidance and anxiety on later 12-step group engagement and prescribed behaviors. We predicted that higher attachment avoidance would result in less frequent 12-step meeting attendance, reduced endorsement of 12-step practices and beliefs, and lower probability of acquiring a 12-step sponsor. Aim 3 investigated

the prediction that attachment avoidance would moderate the benefits of 12-step sponsorship on later drinking frequency and intensity. Here we reasoned that, among those who had gained 12-step sponsors, a participant with high attachment avoidance would be less likely to form an intimate, secure, and ultimately beneficial relationship with his or her sponsor than would a low-avoidance participant.

Method

Participants

This study is one of the initial reports of a large prospective study (NIAAA grant R01AA014197) investigating behavior change associated with 12-step mutual aid group engagement (see also Tonigan and Rice, 2010). The study included 253 alcohol-dependent adults recruited as they presented for outpatient substance use treatment ($n = 87$), from AA groups ($n = 68$), and from community sources, such as homeless shelters, advertisement in neighborhood newspapers, and flyers ($n = 98$). To investigate early change processes in 12-step organizations (and to avoid the confounding effects of prior AA histories), we used narrow eligibility criteria: prospective participants were excluded if they reported having more than 16 weeks of lifetime AA exposure or if they reported having achieved a period of alcohol abstinence of at least 12 months at any time in their life after their alcohol use had become a problem. Participants were not excluded because of illicit substance use or dependence. For inclusion, participants must have attended one or more AA meetings in the previous 3 months, consumed alcohol in the previous 90 days, and met *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (American Psychiatric Association, 2000), criteria for alcohol dependence or abuse. All procedures were approved by the institutional review board at the University of New Mexico (UNM Protocol No. 24028).

Procedures

Before consent, breath alcohol analysis was used to ensure that each participant's blood alcohol concentration did not exceed .05%. After informed consent, participants completed a set of semi-structured interviews, questionnaires, and urine toxicology screens. Follow-up interviews were conducted at 3, 6, 9, 12, 18, and 24 months after baseline. All measures relevant to this study were included at each of these intervals except for the demographic interview and Alcohol Dependence Scale (Skinner and Allen, 1982), which were administered only at baseline, and the Relationship Questionnaire (RQ; Bartholomew and Horowitz, 1991; Griffin and Bartholomew, 1994b), which was administered only at baseline, 6 months, and 12 months. Participants received $50 for each completed interview.

Follow-up interviews were conducted in person or, when necessary, by telephone. If a participant missed an interview but was later successfully interviewed, the Form 90 (Miller, 1996) measures (described below) for the missed period were reconstructed using a self-report procedure. Strong support has been reported for the validity of reconstructed self-reported alcohol use data spanning 12 months and longer (Maisto et al., 1979, 1982; Project MATCH Research Group, 1997a, 1997b). At 3 months, 214 participants (85%) were successfully interviewed contemporaneously, and 25 participants (9.9%) provided information at a later assessment for reconstruction of the 3-month interview data, resulting in complete data for 239 participants (94.5%). The follow-up rates for the remaining interviews included, at 6 months, 210 (85%) contemporaneous and 29 (11%) reconstructed interviews; at 9 months, 189 (75%) and 48 (19%); at 12 months, 206 (81%) and 27 (11%); and at 18 months, 199 (79%) and 30 (12%).

Summarizing the reconstruction efforts across 12 months of follow-up, 182 participants (71.9%) provided complete contemporaneous data, 34 participants (13.4%) provided complete contemporaneous data with the exception of one reconstruction, 21 participants (8.3%) provided information for reconstruction of two interviews, 12 participants (4.7%) provided information for reconstruction of three interviews, and 4 participants (1.6%) reconstructed the entire 12 months at the 12-month interview. Including reconstructed data, total follow-up rates for the interviews at 3, 6, 9, 12, and 18 months were 94.5%, 94.5%, 93.7%, 92.1%, and 90.5%, respectively. Among contemporaneous interviews at 3, 6, 9, 12, and 18 months, 4.7%, 5.7%, 5.3%, 4.4%, and 7.0%, respectively, were conducted by telephone.

Measures

Demographic interview. Items measured age, level of education, marital status, employment status, and ethnicity. One additional interview item assessed both cohabitation status and homelessness.

Adult attachment. The RQ collects self-reported endorsements of prototype descriptions (which correspond to the secure, fearful, preoccupied, and dismissing attachment style categories) using four 7-point self-rating items. Moderate stability has been reported for these individual prototype ratings (reviewed by Mikulincer and Shaver, 2007); for example, Scharfe and Bartholomew (1994) reported 8-month test–retest stability for each of the four items, with Pearson r values among the four items ranging from .45 to .58 for women and from .39 to .58 for men.

The RQ has two scales that reflect attachment avoidance ("RQ-avoidance") and attachment anxiety ("RQ-anxiety"). Convergent validity has been established for each scale: RQ-anxiety relates to interview-based measures of attachment anxiety that focus on family ($r = .34$) and peer ($r =$

.39) relationships, and RQ-avoidance relates to interview-based measures of attachment avoidance that focus on family (r = .39) and peer (r = .50) relationships (Griffin and Bartholomew, 1994b). Both RQ scales negatively predict individuals' reported feelings of receiving social support (reviewed by Mikulincer and Shaver, 2007). The two scale scores were each computed from the same four items, using different combinations of positive and negative unit weights: RQ-avoidance was calculated as (fearful + dismissing – secure – preoccupied); RQ-anxiety was calculated as (fearful + preoccupied – secure – dismissing). Each of the scales had a possible range of -12 to 12, where higher scores indicate greater attachment avoidance or attachment anxiety. We selected this scoring method to reflect the standard use of "anxiety" and "avoidance" to label the two dimensions shared by most self-report measures of adult attachment (Brennan et al., 1998; Fraley and Waller, 1998). Reversed measures of these dimensions, labeled Model of Other and Model of Self (to reflect a hypothesis of attachment behavior; see Griffin and Bartholomew, 1994b), are frequently reported as RQ outcomes. To obtain equivalent Model of Other and Model of Self scores, one may multiply our reported RQ-avoidance and RQ-anxiety values, respectively, by -1.

Motivation, treatment, and substance use

Alcohol problem severity was measured using the Alcohol Dependence Scale (Horn et al., 1984; Skinner and Horn, 1984). The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES; Miller and Tonigan, 1996) was used to measure participant ambivalence about alcohol use and readiness for change. Of the three SOCRATES scales, the seven-item Problem Recognition scale was selected to measure motivation for change. It has demonstrated reliability (Miller and Tonigan, 2001) and is predictive of help-seeking behaviors.

Retrospective self-reports of alcohol use were collected using two measures from the Form 90 (Miller, 1996), a calendar-based structured interview. Proportion of days abstinent from alcohol (PDA) was defined as the number of alcohol-abstinent days in an assessment period divided by the total number of days in the period. Drinks per drinking day (DPDD) was defined as number of drinks consumed per drinking day divided by the number of drinking (i.e., nonabstinent) days in the period. Test–retest reliability estimates for the Form 90 measures of PDA (intraclass correlation [ICC] = .85) and DPDD (ICC = .71) have been reported (Tonigan et al., 1997). The Form 90 also collects reports of treatment received in three areas (alcohol, drug, or emotional problems) and two settings (outpatient or inpatient). Our measure of professional treatment exposure, "proportion treatment days," was computed as the total number of days of treatment received (across the three areas and two settings) divided by the number of days in an assessment period.

Twelve-step domains. An item from the Form 90 interview was used to compute the proportion of days that participants attended 12-step meetings ("meeting attendance"). Here, reported number of days in which a 12-step meeting was attended was divided by the total number of days in an assessment period. The General Alcoholics Anonymous Tools of Recovery (GAATOR; Montgomery et al., 1995; Tonigan et al., 2000) was used to measure commitment to 12-step practices. Its 24 four-point Likert-type items (e.g., "I have shared my personal inventory with someone I trust") were summed to produce a total score (GAATOR). From the 13-item Alcoholics Anonymous Involvement questionnaire (Tonigan et al., 1996a), one item asks participants if they have had an AA sponsor during the last 60 days (yes/no); this was used to measure sponsorship as a dichotomous variable ("sponsorship"). The 60-day reporting period for this single item (which leaves a 30-day gap in coverage for each 90-day follow-up interval) was an oversight that was not initially detected; for consistency, we left the item unchanged throughout all interviews.

Statistical analyses

Analyses for Aim 1 compared sample RQ-avoidance and RQ-anxiety mean scores with a nonclinical sample of college students (Schmitt et al., 2004). Although comparison with a disproportionately educated population is not ideal, this is by far the largest sample of RQ measurements on record and provides the best available approximation of RQ measurement norms (Bartholomew, 2006). Values reported by Schmitt et al. (2004) included scale means and standard deviations for five U.S. regions, using the "Model of Other"/"Model of Self" method of RQ scale computation (Griffin and Bartholomew, 1994b). We converted these to equivalent RQ-avoidance and RQ-anxiety scale values by multiplying each mean by -1. From these regional values, an overall U.S. mean (calculated as a weighted average) and standard deviation (calculated as the sum of squared deviations from the grand mean, divided by the total sample size -1) were produced for each scale. The two group means were then compared for each scale. To investigate change over time (baseline, 6 months, and 12 months) in attachment avoidance and anxiety, we used hierarchical linear modeling (HLM; Raudenbush and Bryk, 2001). The HLM for Windows software package (Version 6.0; Scientific Software International Inc., Lincolnwood, IL) was used for all HLM analyses. Unconditional growth models were used, with intercept and time (linear) as Level 1 random effects predictors. Analyses used restricted maximum likelihood estimation and data were centered at baseline.

Analyses for Aims 2 and 3 also used HLM with restricted maximum likelihood estimation. Data were data centered at baseline for Aim 2 analyses and at mid-follow-up (6 months) for Aim 3 analyses. Aim 2 used three lagged growth mod-

els to investigate whether time-varying RQ-avoidance and RQ-anxiety measures jointly predicted our three dependent measures of 12-step group engagement: 12-step meeting attendance (meeting attendance), practice of prescribed 12-step behaviors (GAATOR), and acquisition of a 12-step sponsor (sponsorship), respectively. For the dichotomous dependent measure, sponsorship, a Bernoulli sampling model and a logit link function were used. Three pairs of lagged time points were simultaneously used in each analysis: attachment measures taken at baseline, 6 months, and 12 months were used to predict 12-step group engagement measures taken at 3, 9, and 18 months, respectively. To isolate attachment effects from the effects of motivation for change and professional treatment, two time-varying covariates, proportion treatment days and SOCRATES problem recognition, were added to each analysis (each measured at baseline, 6 months, and 12 months). Intercept and time (linear) were included as Level 1 random effects predictors and all other effects were fixed.

Aim 3 tested whether baseline RQ-avoidance moderated the beneficial effects of 12-step sponsorship on subsequent drinking (PDA and DPDD). To simplify interpretation, baseline RQ-avoidance scores were split at their median value (0), producing a dichotomous variable ("avoidance category") that classified participants as low-avoidance (RQ-avoidance ≤ 0) or high-avoidance (RQ-avoidance > 0). The effects of avoidance category were examined using two separate lagged HLM analyses, predicting PDA and DPDD, respectively. For each analysis, the dependent variable was measured at 3, 6, 9, and 12 months, and two time-varying covariates, proportion treatment days and SOCRATES problem recognition, were included, each measured at baseline and 3, 6, and 9 months. Level 2 of each model included avoidance category and 3-month sponsorship (main effects and product term) and terms for the two- and three-way interactions of these variables with time (Sponsorship × Time, Avoidance Category × Time, and Sponsorship × Avoidance Category × Time).

Results

Of 253 consented participants, 247 provided sufficient RQ data to compute baseline avoidance and anxiety scales. Only these 247 participants are considered for all analyses. About 65% were men ($n = 162$), and the mean age was 38.69 years ($SD = 9.76$). The majority were unemployed (64.5%), and 17.5% reported being homeless. Ethnic ancestry was predominantly Hispanic (41.1%), non-Hispanic White (34.5%), and Native American (17.1%); the remaining participants (7.3%) were of African, Asian, or unspecified ancestry. Table 1 provides descriptive information regarding participant help-seeking and alcohol use from baseline through the 18-month follow-up. As shown, the majority continued to report some 12-step meeting attendance throughout the study; at 18 months, participants reported attending one or more meetings about 13 days out of every 90, and 59.4% reported nonzero meeting attendance. Self-reported commitment to prescribed 12-step practices and beliefs (GAATOR) was high at baseline relative to the scale range (24–96) and remained so for the course of the study.

Two methods were used to assess the veracity of the reconstructed PDA measures. First, paired-samples t tests compared reconstructed data (five separate tests used on reconstructed data from 0, 3, 6, 9, and 12 months) with each participant's next contemporaneous interview (3, 6, 9, 12, or 18 months); no discontinuity within participants was indicated (all ps $\geq .103$). Second, independent-samples t tests (five separate tests used for 3, 6, 9, 12, and 18 months) were conducted to compare all reconstructed reports with all contemporaneous reports. At 6, 9, and 12 months, reconstructed data indicated more drinking than contemporaneous data; the largest obtained statistic was $t(231) = 2.68$, $p = .008$. No significant differences were observed at 6 or 18 months. This suggests veracity of reconstructions insofar as individuals with more severe drinking are expected to be more difficult to contact consistently for interviews.

TABLE 1.   Help-seeking and drinking behaviors: Baseline through 18 months

Measure	Months from baseline					
	0	3	6	9	12	18
Any 12-step meeting attendance, %	98.4	80.4	69.8	62.7	59.4	57.8
GAATOR, M (SD)	64.17 (12.25)	66.57 (12.74)	65.53 (14.65)	65.79 (15.15)	65.31 (15.76)	65.76 (16.59)
Proportion days abstinent, M (SD)	0.54 (0.31)	0.77 (0.33)	0.8 (0.31)	0.78 (0.33)	0.78 (0.33)	0.79 (0.33)
Drinks per drinking day, M (SD)	17.53 (12.66)	8.34 (10.7)	7.19 (8.7)	6.75 (8.46)	6.87 (8.88)	6.82 (8.75)
Problem recognition, M (SD)	30.77 (5.11)	28.8 (6.17)	27.77 (6.88)	27.59 (6.63)	26.93 (6.86)	26.53 (7.1)
Proportion treatment days, M (SD)	0.08 (0.15)	0.12 (0.22)	0.10 (0.25)	0.05 (0.11)	0.05 (0.15)	0.06 (0.16)
Meeting attendance, M (SD)	0.17 (0.18)	0.29 (0.32)	0.19 (0.25)	0.15 (0.23)	0.15 (0.24)	0.14 (0.23)
Sponsored, %	44.9	44.4	44.3	41.9	42.8	33.5

Notes: Statistics were calculated using all available data from each interview. The dichotomous measure "Any 12-step meeting attendance" was computed as the percentage of participants reporting nonzero values for 12-step meeting attendance days on the Form 90. GAATOR = General Alcoholics Anonymous Tools of Recovery Scale, total score; problem recognition = Stages of Change Readiness and Treatment Eagerness Scale, problem recognition subscale.

Large pre–post improvements in PDA were observed. Participants on average reported about 54% abstinent days at baseline and 79% abstinent days at the 18-month interview, and pre–post change in PDA was significant within participants, paired-samples $t(224) = 10.43$, $p < .001$, $d = 0.70$. Likewise, DPDD was significantly reduced within participants from baseline to the 18-month interview, paired-samples $t(224) = -10.86$, $p < .001$, $d = 0.72$.

Aim 1

Mean baseline RQ-avoidance and RQ-anxiety scores for our sample ($n = 247$) were 0.22 ($SD = 4.47$) and -0.02 ($SD = 4.43$), respectively. After aggregating across five college samples (Schmitt et al., 2004; $N = 2,793$) the referent population means for RQ-avoidance and RQ-anxiety were -0.14 ($SD = 4.09$) and -1.67 ($SD = 3.93$), respectively. Our sample of 12-step affiliates and the aggregated sample of U.S. college students did not differ, on average, in attachment avoidance ($g = 0.09$, $p = .22$). In contrast, the 12-step sample reported, on average, significantly higher attachment anxiety relative to the general U.S. college sample ($g = 0.42$, $p < .001$) (a small-to-medium difference; Cohen, 1988). The results of the HLM growth models used for Aim 1 indicated that RQ-anxiety scores did not change significantly over time, $b = -0.03$, $t(674) = -1.38$, $p = .170$, but RQ-avoidance scores did significantly decline over time, $b = -0.06$, $t(674) = -2.47$, $p = .014$. The variation in the magnitude of this decline in attachment avoidance was, within sampling error, relatively homogenous between participants, $\chi^2(230) = 233.35$, $p = .43$.

Aim 2

Table 2 displays the results of the lagged HLM analyses used for Aim 2. As predicted, RQ-avoidance (measured at baseline, 6 months, and 12 months) was related to all three 12-step engagement measures (measured at 3, 9, and 18 months). Higher RQ-avoidance was associated with significantly less frequent meeting attendance and significantly fewer 12-step behaviors (GAATOR) reported at the next follow-up interview. Likewise, a significant inverse relationship between RQ-avoidance and sponsorship was found, such that high-avoidance individuals were less likely to report having an AA sponsor at the next follow-up interview. Baseline attachment anxiety, by contrast, was not significantly related to any of the three 12-step outcomes in these lagged analyses.

Aim 3

Participants often gained a 12-step sponsor despite high attachment avoidance: 37.3% of those with above-median baseline avoidance scores reported sponsorship by the 12-month follow-up (in comparison with 48.1% of partici-

TABLE 2. Summary of lagged models for predicting meeting attendance, GAATOR, and sponsorship

Predictor variable	b	SE	t	p
Meeting attendance				
RQ-Anxiety	0.002	0.002	0.81	.416
RQ-Avoidance	-0.007	0.002	-3.42**	.001
Problem recognition	0.005	0.001	3.29**	.001
Proportion treatment days	0.151	0.056	2.70**	.007
Time (linear)	-0.066	0.010	-6.25**	.001
GAATOR				
RQ-Anxiety	0.096	0.130	0.74	.458
RQ-Avoidance	-0.334	0.114	-2.93**	.004
Problem recognition	-0.015	0.095	-0.16	.878
Proportion treatment days	1.800	2.450	0.73	.463
Time (linear)	-0.570	0.535	-1.07	.288
Sponsored				
RQ-Anxiety	0.031	0.027	1.17	.243
RQ-Avoidance	-0.054	0.024	-2.22*	.027
Problem recognition	0.051	0.017	3.01**	.003
Proportion treatment days	0.858	0.541	1.59	.113
Time (linear)	-0.234	0.107	-2.18*	.030

Notes: GAATOR = General Alcoholics Anonymous Tools of Recovery, total score; RQ-anxiety = Relationship Questionnaire, anxiety scale; RQ-avoidance = Relationship Questionnaire, avoidance scale; problem recognition = Stages of Change Readiness and Treatment Eagerness Scale, problem recognition subscale.
*$p < .05$; **$p < .01$.

pants with below-median baseline avoidance). The lagged HLM analyses for Aim 3 were designed to investigate whether avoidance category moderated the relationship between sponsorship and later alcohol use. For the outcome measure PDA, the main effect of avoidance category was nonsignificant, $b = 0.05$, $t(793) = 0.91$, $p = .37$. The main effect of 3-month sponsorship on PDA was significant, $b = 0.24$, $t(793) = 5.21$, $p < .001$, such that sponsored participants ($n = 96$) had a higher overall mean PDA across the four interview points ($M = 0.90$, $SD = 0.176$) than did nonsponsored participants ($n = 120$, $M = 0.70$, $SD = 0.303$). The interaction of avoidance category and sponsorship was nonsignificant, $b = -0.09$, $t(793) = -1.37$, $p = .17$, indicating that the strength of the positive relationship between 3-month sponsorship and PDA did not differ between the low-avoidance and high-avoidance groups. No effect interacted with time, indicating no tendency for 3-month sponsorship to have differing effects at earlier or later points.

An identical pattern of findings was produced for the drinking intensity measure, DPDD. There was (a) no main effect of avoidance category on mean DPDD, $b = 0.011$, $t(793) = 0.01$, $p = .99$; (b) a significant main effect of sponsorship, $b = -3.41$, $t(793) = -3.08$, $p = .003$, such that overall mean DPDD values (collapsed across the four interview points) were significantly lower among adults who reported having a sponsor ($M = 5.49$, $SD = 6.83$) compared with those who did not ($M = 8.10$, $SD = 6.69$); (c) a nonsignificant avoidance category by sponsorship interaction, $b = 2.37$, $t(793) = 1.34$, $p = .18$; and (d) no effect that interacted with time.

Discussion

This sample of problem drinkers initially seeking help in 12-step programs reported elevated attachment anxiety (but not attachment avoidance) relative to a broader U.S. college student population. Attachment anxiety remained consistently high throughout the 12 months in which it was measured. However, differences in attachment anxiety within the sample appeared to be relatively unimportant for predicting 12-step attendance and engagement in prescribed 12-step practices. In contrast, findings indicated that avoidance of social attachment, as measured at a given interview, was an important predictor of engagement at the next follow-up interview: higher attachment avoidance predicted lower rates of obtaining a 12-step sponsor, less frequent attendance at 12-step meetings, and less practice of prescribed 12-step-related behaviors. These findings support the hypothesis that the social interactions prescribed by 12-step programs tend to be aversive or difficult if the individual is relatively avoidant of social attachment. Such individuals might particularly benefit from the availability of Internet-based meetings (Roth and Tan, 2008) as supplements to direct social interactions they may find aversive.

Although higher attachment avoidance predicted less engagement in measured socially focused 12-step activities (which have well-established prognostic value in predicting increased abstinence; e.g., Kelly et al., 2010b; Tonigan and Rice, 2010), reductions in substance use over time were similar between high-avoidance and low-avoidance 12-step affiliates. At first glance, this appears contradictory. Several plausible explanations for this unexpected finding can be offered. First, some prescribed 12-step practices, such as reading core literature, do not require social interactions. It is therefore possible that highly attachment-avoidant participants engaged in these nonsocial activities at higher rates than those with low avoidance, thereby compensating for their relative paucity of social 12-step practices. Because we did not specifically measure nonsocial 12-step practices, this speculation could not be tested directly. Instead, we conducted a post hoc analysis of a single item from the Alcoholics Anonymous Involvement questionnaire: "How would you rate the importance of attending AA meetings for your sobriety?" Over time (3, 6, 9, 12, and 18 months) this rated importance declined significantly across all participants (b = -0.11, $p <$ .001), but rate of decline did not differ by baseline avoidance category (above-median avoidance: b = -0.13; below-median avoidance: b = -0.10; p = .409). The difference in the ratings between the two avoidance categories (above-median avoidance: M = 3.78; below-median avoidance: M = 3.71) was not significant, $t(234)$ = -0.75, p = .651 (data centered at 6 months). No support was found, therefore, for the hypothesis that high-avoidance 12-step affiliates compensate for lower engagement with social 12-step behaviors and consequently rely less on meetings for abstinence support.

A second possible explanation relates to the finding that attachment avoidance declined significantly during the course of the study. Although the extent of this decline was relatively consistent between participants, it nevertheless suggests that the avoidant behavior measured by the RQ-avoidance scale may be particularly unstable among new 12-step affiliates. This is consistent with the reduction in stability of attachment measures found when participants experience heightened life stressors, such as interpersonal conflict and loss (Davila and Cobb, 2003). Because many new 12-step affiliates may experience precipitating stressors leading to help-seeking, and because all experience the stress of initial 12-step program engagement, measurement of stable, underlying individual differences in predispositions toward attachment behavior may be particularly difficult in this population.

The change observed in attachment avoidance over the first year of affiliation also suggests a possible mechanism for the previously documented effects of 12-step group affiliation on social support networks. Research indicates that, during 12-step affiliation, network support of drinking decreases and network support of abstinence increases (Humphreys and Noke, 1997; Kelly et al., 2011), and that these changes are important predictors of continued abstinence (Kaskutas et al., 2002). Relationships with friends and spouses also improve with AA attendance (Humphreys et al., 1997). Future research should aim to clarify whether the decreases in attachment avoidance we observed are causally related to such social support changes.

Most treatment providers have a positive view of 12-step groups (Forman et al., 2001) and usually refer substance-using clients to 12-step groups (Humphreys, 1997; Laudet and White, 2005). Our lagged analyses, which controlled for the self-selective confound of treatment motivation, offered some evidence that professional treatment can facilitate 12-step attendance. However, professional treatment did not predict commitment to 12-step-related practices or acquisition of a sponsor. The absence of these effects might be explained by (a) an emphasis by treatment providers on meeting attendance over other aspects of 12-step group engagement, (b) use of ineffective clinical strategies to facilitate 12-step behaviors and sponsorship, and (c) assumptions by treatment providers that sponsorship and 12-step behaviors naturally follow from meeting attendance. Because having a 12-step sponsor has demonstrated benefit for reducing substance use (Tonigan and Rice, 2010), clarifying these alternatives is an important priority for future research.

Limitations of study findings should be acknowledged. First, the comparison between 12-step group affiliates and a college sample is an imperfect test of differences between 12-step and non-12-step populations. Age and educational differences between the groups may partially explain the group difference found in attachment anxiety. Proportions of men and women, employment status, and income levels

also probably differ between the two groups because of self-selection of individuals into 12-step groups and into the college population.

Second, this study did not investigate mechanisms that may account for sponsorship benefits or details of sponsor relationships. The use of a binary "yes/no" response as our sponsorship measure limits the interpretation of effects. Sponsors take on a wide variety of roles (Whelan et al., 2009) and may vary in, for example, frequency of contact, quality of social interaction, and specific behaviors encouraged. Development of multidimensional measures of sponsor relationships and interactions could help to clarify the nature and mechanisms of sponsorship benefits. Conceivably, different mechanisms may operate in high- and low-avoidance individuals to produce roughly equivalent outcomes. For example, attachment-avoidant individuals might plausibly have less intimate relationships with multiple sponsors and benefit from the diversity. The development of effective clinical strategies for encouraging sponsorship will require more understanding of how high-avoidance individuals interact with sponsors.

Finally, stronger causal inferences can be made in nonexperimental studies by statistically controlling for extraneous variables that affect outcomes. Although we included concurrent measures of formal treatment and motivation for change in all prospective analyses, other confounding effects may have been present. The effects of attachment avoidance might be accounted for by the broader construct of social anxiety, which predicts self-reports of shyness as an obstacle to 12-step participation (Book et al., 2009). Clarification of these potential measurement redundancies will be an important next step for understanding the utility of attachment dimensions as predictors of 12-step engagement.

In summary, variation in self-reported adult attachment avoidance among new 12-step affiliates is an important predictor of subsequent 12-step attendance, beliefs, behaviors, and sponsor acquisition; in contrast, although attachment anxiety tends to be heightened in this group, its variation does not predict these outcomes. However, baseline measurement of attachment avoidance is unlikely to be useful for predicting sponsorship or the long-term benefits of sponsorship. Further progress toward prediction and facilitation of 12-step group engagement will require continued investigation into individual differences in social behavior, including attachment avoidance, which may affect or be affected by the social processes of the 12-step program.

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