

Six-Month Changes in Spirituality and Religiousness in Alcoholics Predict Drinking Outcomes at Nine Months*

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ABSTRACT. Objective: Although spiritual change is hypothesized to contribute to recovery from alcohol dependence, few studies have used prospective data to investigate this hypothesis. Prior studies have also been limited to treatment-seeking and Alcoholics Anonymous (AA) samples. This study included alcohol-dependent individuals, both in treatment and not, to investigate the effect of spiritual and religious (SR) change on subsequent drinking outcomes, independent of AA involvement. **Method:** Alcoholics ($N = 364$) were recruited for a panel study from two abstinence-based treatment centers, a moderation drinking program, and untreated individuals from the local community. Quantitative measures of SR change between baseline and 6 months were used to predict 9-month drinking outcomes, controlling for baseline drinking and AA involvement. **Results:** Significant 6-month changes in 8 of 12

SR measures were found, which included private SR practices, beliefs, daily spiritual experiences, three measures of forgiveness, negative religious coping, and purpose in life. Increases in private SR practices and forgiveness of self were the strongest predictors of improvements in drinking outcomes. Changes in daily spiritual experiences, purpose in life, a general measure of forgiveness, and negative religious coping also predicted favorable drinking outcomes. **Conclusions:** SR change predicted good drinking outcomes in alcoholics, even when controlling for AA involvement. SR variables, broadly defined, deserve attention in fostering change even among those who do not affiliate with AA or religious institutions. Last, future research should include SR variables, particularly various types of forgiveness, given the strong effects found for forgiveness of self. (*J. Stud. Alcohol Drugs*, 72, 660–668, 2011)

SIX-MONTH CHANGES IN spirituality and religiousness (SR) in patients with alcohol use disorders entering treatment were previously described (Robinson et al., 2007). Significant changes were found in 5 of 10 SR dimensions, and positive change in two (daily spiritual experiences and purpose in life) were associated with no heavy drinking at 6 months, controlling for Alcoholics Anonymous (AA) involvement and gender. However, the sample in this earlier study was drawn from one site; included individuals with abuse as well as dependence; and did not include untreated individuals, who make up the bulk of those with alcohol use disorders in this country (Cohen et al., 2007; Dawson et al., 2005, 2007). In addition, the analyses in our 2007 article investigated only the relationship of 6-month SR change to 6-month drinking, not to subsequent drinking, which is a more powerful test of the impact of SR change. The longitudinal survey described here obtained SR data at baseline and 6 months as well as drinking data at baseline and 9 months, allowing us to test whether 6-month SR change predicts subsequent drinking. The sample of 364 alcohol-dependent individuals was drawn from four sources—two outpatient

treatment programs, a moderated drinking program, and untreated alcoholics recruited from the larger community.

Since our earlier article (Robinson et al., 2007), other studies have investigated this issue, all recruiting from treatment programs or AA. Three described SR change in alcoholics in treatment (Piderman et al., 2007, 2008; Sterling et al., 2007). Piderman and colleagues' longitudinal survey of 74 alcoholics found increases in spiritual well-being, private religious practices, and positive religious coping from intake to discharge (2007). At 1-year follow-up, those who had achieved 1 year of abstinence were compared with those who had not, combined with those lost to follow-up (2008). Increases from intake to discharge in private SR practices (e.g., prayer, reading) and existential well-being were associated with sobriety. Sterling and colleagues (2007) divided a treatment sample at 3-month follow-up into two matched groups: those who had achieved 1 month of sobriety and those who had not. SR was measured at intake, discharge, and 3-month follow-up. Although the SR of both groups increased from baseline to discharge, at the 3-month follow-up individuals who relapsed had significantly lower scores on two SR measures than those who did not.

Two studies investigated spiritual change in cross-sectional, retrospective surveys of AA members. Poage et al. (2004) found that length of sobriety correlated with a spirituality measure but not with contentment or stress. Sandoz (1999) asked 56 members of AA about spiritual experiences. Those who had such experiences ($n = 46$) were older and reported longer sobriety, working more AA steps, and providing AA-related service.

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Another group of studies used samples from drug- and alcohol-dependence treatment and found similar results (Carrico et al., 2007; Flynn et al., 2003; Heinz et al., 2007; Jarusiewicz, 2000; Sherman and Fischer, 2002; Stewart and Koeske, 2005).

The studies described above provide additional evidence that SR change may be a factor in recovery. Although longitudinal evidence has confirmed cross-sectional findings, the length of follow-up and the size of the samples are often limited. Some investigators have measured SR only at baseline, although there is clear evidence that it changes over time. In addition, many investigators used a nonspecific measure of spirituality, making it difficult to determine its meaning and which SR dimensions are most likely to change and support recovery. A variety of dimensions may be involved, including SR practices, forgiveness, existential concerns, and day-to-day experiences of SR.

All of these samples were drawn from treatment centers or AA, where one would expect to see SR changes, given the spiritual emphasis of 12-step approaches. We do not know whether SR changes in non-treatment-seeking alcoholics, even though most alcoholics are not in treatment (Cohen et al., 2007)—and many alcoholics, whether treated or not—reduce their drinking over the course of a year (Dawson et al., 2005, 2007). Therefore, it would be useful to examine whether SR changes predict drinking outcomes, without regard to AA involvement and treatment.

Based on these earlier studies, the hypotheses investigated here are that in a large sample of alcoholics (a) increases would be found from baseline to 6 months in day-to-day spiritual experiences, private SR practices, sense of meaning/purpose in life, use of positive SR coping, and forgiveness; (b) 6-month changes would not be found in beliefs, values, use of negative SR coping, and perceptions of God; and (c) 6-month changes in daily spiritual experiences and meaning in life would be associated with less drinking at 9-month follow-up, after controlling for AA involvement.

Method

A naturalistic longitudinal survey of 364 individuals with alcohol dependence was conducted, with data on SR, drinking, AA involvement, treatment, and other variables collected every 6 months. At the intervening 3-month point, data on drinking, AA, and treatment were obtained.

Design and procedure

Recruitment sites were a university-affiliated outpatient treatment program (UOT; $n = 157$), a Veterans Affairs outpatient treatment clinic (VA; $n = 80$), a moderated drinking program (MOD; $n = 34$), and the larger community sample (CS; $n = 93$). The CS participants were not in treatment. The design was a descriptive 3-year panel study follow-

ing individuals with alcohol dependence to determine how changes in drinking, dimensions of SR, and recovery efforts related to each other. As approved by appropriate institutional review boards, all subjects provided written informed consent and were provided compensation for each in-person interview.

Recruitment criteria were (a) being more than 18 years of age; (b) having been diagnosed by the Structured Clinical Interview for DSM-IV (SCID; First et al., 1997) with a lifetime diagnosis of alcohol dependence; (c) having consumed alcohol in the last 90 days; (d) not suicidal, homicidal, or psychotic; and (e) being literate in English. Those recruited from treatment settings were approached after 1 week but not after 4 weeks in treatment (i.e., after detoxification and engagement).

Sites

Potential study participants from UOT and VA sites were identified by clinical record review and then approached by research staff. The MOD program coordinator identified potential respondents who were willing to be contacted. We then screened potential participants by phone with the Rapid Alcohol Problems Screen (RAPS; Cherpitel, 1995), a five-item alcoholism assessment tool. The RAPS questions address drinking on awakening, blackouts, guilt/remorse after drinking, failing to meet expectations, and losing friends because of drinking. Our final subsample (the CS group) was recruited from untreated individuals in the community through advertisements in local print media. When participants called us, we described the study to them, and, if they were interested, they were screened with the RAPS (Cherpitel, 1995). All baseline interviews began with the alcohol-dependence portion of the SCID (First et al., 1997) to confirm diagnoses. Across all sites, 469 individuals were approached by us or contacted us, of whom 364 (77.6%) met criteria and agreed to participate. Response rates and demographic, clinical, and drinking variables varied by site.

Sample

Table 1 presents baseline demographic and clinical characteristics. Two thirds were male (66%), the mean age was 44 years, and the mean amount of education was more than 14 years. More than a third were married or cohabitating with a partner, almost 30% had never married, and about one third were no longer married. The sample's ethnicity reflected the local community, with 82% of the subjects of White ethnicity and 10% of Black ethnicity; the remainder were of other ethnicities, including self-identified multi-ethnicities. More than half were employed full time or part time. Of the 44% unemployed, 24% were retirees, 18% were disabled, and 11% were students. Almost 30% of the sample had an annual income less than \$15,000, although 22%

made more than \$85,000. Comparing this sample with that of our previous study (Robinson et al., 2007), this one was somewhat older and more educated, and it included fewer African Americans. Compared with the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) nationally representative sample of alcoholics (Dawson et al., 2005), this sample appeared similar in age, male/female ratio, and education, but fewer subjects were married.

Regarding clinical characteristics, 57% of participants had severe dependence (six to seven DSM criteria; SCID; First et al., 1997). More than half had been in treatment before study entry. Age at onset was mid-20s; more than 85% reported a family history of alcohol problems. Scores on a measure of consequences of alcohol problems, the Short Inventory of Problems (SIP; Forchimes et al., 2007; Miller et al., 1995), indicated a moderate level of alcohol problems

($M = 21.0$). Almost three quarters (72%) stated that they wanted to be abstinent. Three quarters reported having AA experience, and a smaller percentage (67%) had attended a meeting. Again, informally comparing this sample with the NESARC sample (Dawson et al., 2005), this sample had a slightly older age at onset and higher rates of family history of alcohol problems.

Retention and attrition analysis

Of the 364 participants who completed the baseline interview, 316 (86.8%) completed the 6-month interview. At 9 months, valid drinking data were collected on 283 respondents (77.7%). A 6-month attrition analysis (Menard, 1991) showed no significant differences on demographic variables in Table 1 among those retained and not retained. Of the clinical variables, only SIP scores differed significantly, with nonparticipants at 6 months having higher SIP scores. A second attrition analysis with 9-month data found that, among demographics, only education varied significantly (14.5 years retained vs. 13.7 not retained). We also found differences on four clinical variables: age at first symptoms (29.2 years vs. 26.0, respectively), SIP scores (20.2 vs. 23.5), experience with AA (72% vs. 84%), and prior AA meeting attendance (64% vs. 78%). Those retained had fewer drinks per drinking day (DDD; 9.01 drinks vs. 11.4). This pattern of attrition suggests that the 9-month data may include the less severe alcoholics. However, because there were no differences in SCID severity, physiological dependence, and wanting to be abstinent, we are fairly confident that this analysis provides useful information on changes in SR and drinking among alcoholics.

Measures

All measures, except drinking data, were obtained at baseline and at 6 months. Internal reliability estimates from our sample are presented where appropriate.

Alcohol use and consequences. Every 3 months, data on alcohol use during the prior 90 days were obtained with the Timeline Followback (TLFB) interview (Sobell and Sobell, 1992; Sobell et al., 1996). From the TLFB, we calculated percentage of days abstinent (PDA), percentage of heavy drinking days (PHDD), average number of DDD, and number of days since last drink (DSLDD). Heavy drinking was defined as five or more standard drinks per day for men or four or more for women.

Negative consequences of alcohol use were assessed with the SIP (Miller et al., 1995), which had Cronbach's α coefficients of .93 and .95 at baseline and 6 months, respectively.

Spirituality and religiousness. SR instruments were drawn from the psychology of religion literature and prior research (Robinson et al., 2007). Using the same definitions of SR previously developed (Robinson et al., 2007), we op-

TABLE 1. Demographics and clinical characteristics at baseline ($N = 364$)

Variable	% or M (SD)
Demographic variables	
Gender	
Male	65.7%
Female	34.3%
Age, in years	44.0 (12.8)
Education, in years	14.3 (2.5)
Marital status	
Never married	28.8%
Married/cohabitating	38.2%
Separated, divorced, widowed	33.0%
Ethnicity	
White	81.9%
Black	10.4%
Multiracial	3.3%
Other	4.4%
Employment status	
Full time	40.1%
Part time	15.9%
Unemployed	44.0%
Income	
\leq \$15,000	29.1%
\$15,001–\$30,000	16.2%
\$30,001–\$45,000	11.5%
\$45,001–\$60,000	9.9%
\$60,001–\$85,000	10.2%
\geq \$85,001	21.7%
Clinical variables	
Prior alcohol treatment? (% yes)	52.5%
SCID severity	
Mild, 3–4 symptoms	25.8%
Moderate, 5 symptoms	16.8%
Severe, 6–7 symptoms	57.4%
Physiological dependence	84.9%
Age at first alcohol problems	28.5 (12.2)
Family history of alcohol problems	86.5%
SIP score	21.0 (11.5)
Want to be abstinent? (% yes)	72.0%
Prior AA experience?	74.5%
Ever attended an AA meeting?	67.3%
Attended AA meeting in last year?	37.9%

Notes: Percentages on income may not add up to 100% because of missing data. All respondents have SCID-verified lifetime alcohol-dependence diagnoses. SCID = Structured Clinical Interview for DSM-IV; SIP = Short Inventory of Problems; AA = Alcoholics Anonymous.

erationalized SR on several dimensions, drawing heavily on the monograph from the Fetzer Institute/National Institute on Aging (1999). The SR dimensions from that report used here are the following: private practices; day-to-day spiritual experiences; meaning, values, and beliefs; forgiveness; and religious coping. We also added perceptions of God, beliefs, sense of purpose/meaning in life, and a more robust measure of forgiveness. Higher scores on all SR variables indicate higher levels.

Perceptions of God were assessed with the Loving and Controlling God scales (Benson and Spilka, 1973), two five-item semantic differential scales (0–6) of perceptions of God. The Loving God scale had Cronbach's α 's of .79 and .78 at baseline and 6 months, respectively. The reliability of the Controlling God scale was more marginal, with α 's of .69 and .70.

Beliefs were measured with the first item of the Religious Background and Behaviors scale (Connors et al., 1996) used in Project MATCH (Matching Alcoholism Treatments to Client Heterogeneity), which assesses belief in God and practice of religion. The baseline mean on this 5-point scale was 3.8 ($SD = 1.2$) ($3 = I$ don't know what to believe about God and $4 = I$ believe in God, but I'm not religious), which was congruent with other indicators (e.g., religious preference, congregational involvement, self-ranking of one's religiousness and spirituality) that respondents are generally not religious, although most believe in God.

Private SR practices were assessed with a five-item scale from the Fetzer Institute/National Institute on Aging monograph (1999), measuring the frequency of prayer, meditation, scripture reading, or other private SR behaviors. The α 's for this scale were .77 at both baseline and 6 months.

Daily Spiritual Experiences (Underwood and Teresi, 2002) measures such day-to-day experiences as a sense of connection with God; receiving strength, comfort, and love from God; experiences of peacefulness and awe; and a longing for closeness with God. Participants responded to 16 items on a 6-point scale ranging from *never or almost never* to *many times a day*. Baseline and 6-month α 's were .94 and .95, respectively.

Six items from the Fetzer Institute/National Institute on Aging (1999) measured values and beliefs, such as "I have a sense of mission or calling in my own life," "I feel a deep sense of responsibility for reducing pain and suffering in the world," and "I believe in a God who watches over me." Baseline and 6-month α 's were .83 and .81, respectively.

Forgiveness was measured with three scales to ensure robust measurement of a factor that figures largely in writings on recovery (AA, 1976; Kurtz and Ketcham, 1992; Webb and Trautman, 2010). The three-item Forgiveness Scale from the Fetzer Institute/National Institute on Aging (1999) measures forgiving others, forgiving one's self, and feeling forgiven by God on a four-point scale ranging from *never* to *almost always*. Baseline and 6-month α 's were both low

(.46)—which is not surprising, given the small number of items and the disparate domains measured.

In addition, the Mauger scales (Mauger et al., 1992) assess forgiveness of self and of others. These two 15-item scales use dichotomous (*true/false*) response options. Forgiveness of self had α 's of .83 and .77 at baseline and 6 months, respectively, whereas forgiveness of others had α 's of .77 and .75.

The use of positive and negative religious coping strategies in stressful situations was measured with an adaptation of Pargament et al.'s (1998) Brief RCOPE. Positive religious coping reflects a secure relationship with God, belief that life has meaning, sense of spiritual connectedness to others, benevolent reappraisals, collaborative religious coping, seeking spiritual support, and connection to God and others. Negative religious coping reflects feeling punished or abandoned by God. Response options on 16 items ranged on a 4-point scale from *not at all* to *a great deal*. Positive religious coping had baseline and 6-month α 's of .93 and .95, and negative religious coping had baseline and 6-month α 's of .74 and .72, respectively.

Existential meaning/purpose was measured with Crumbaugh and Maholick's (1964) Purpose in Life scale, used in previous studies (Robinson et al., 2007; Waisberg and Porter, 1994). Based on Frankl's existential perspective (1969, 1992), this scale assesses the degree to which an individual has a sense of meaning or significance in his or her life. This 20-item measure has 7-point Likert response scales. In this sample, α 's were .88 at baseline and .91 at 6 months.

Involvement in Alcoholics Anonymous. The AA Involvement (AAI) scale (Tonigan et al., 1996), which includes attendance data (lifetime and past year) and an involvement subscale, was adapted for this study. Two items that overlapped with our follow-up periods were excluded. The modified AAI scale used in this study had six items, with *yes/no* responses on AA activities such as having a sponsor, providing service, sense of being a member of AA, and celebrating a sobriety birthday. Baseline and 6-month α 's for the modified AAI subscale were .81 and .74. At baseline, the mean score on this measure was 1.83 ($SD = 2.0$), and at 6 months it was 1.81 ($SD = 1.9$). A paired sample *t* test indicated that this change was not significant.

Analysis plan

The distributions of outcome variables were examined to determine whether assumptions of normality in parametric statistical tests would be violated. Two drinking variables at 9 months, PHDD and DDD, were sufficiently skewed that we transformed them into dichotomous variables (e.g., no drinking vs. any). Our analyses next proceeded in two stages: (a) testing for 6-month changes in SR dimensions and (b) whether those SR changes predicted 9-month drinking. We examined the significance of changes in SR variables from

baseline to 6 months using paired sample *t* tests. To obtain an estimate of effect size, Cohen's *d* was calculated (Cohen, 1988, 1992) on each variable changing significantly over 6 months ($p \leq .05$) or nearly significantly ($p < .10$). These SR variables were then individually tested as predictors of each drinking variable at 9 months in a series of multiple linear regression or multiple logistic regression analyses, controlling for that baseline drinking variable and AAI. Baseline AAI was a covariate because of strong relationships with both SR and outcome variables and the lack of significant change in AAI from baseline to 6 months. Given the descriptive nature of the study, Bonferonni corrections were not used. Our analytic emphasis instead was on identifying patterns of significant relationships across drinking and SR variables.

Results

Drinking data at baseline and 9 months

At baseline, mean PDA in the last 90 days was 56.1% ($SD = 31.3$), mean PHDD was 32.7% ($SD = 29.8$), and mean DDD was 9.5 drinks ($SD = 8.2$). Mean DSLD was 25.4 days ($SD = 27.1$). Drinking data at 9 months indicated significant improvement ($p \leq .05$) on all drinking variables. At 9 months, PDA in the last 90 days was 80.7 ($SD = 31.0$), with 45.6% of the sample abstinent during that period. PHDD was 8.8% ($SD = 21.0$), and DDD was 3.1 ($SD = 4.3$). Mean DSLD was 130.6 days ($SD = 143.6$).

Six-month changes in spirituality and religiousness variables

Table 2 presents baseline and 6-month means; standard deviations; *ns*; *p* values; and, for those variables that changed significantly or approached significance, Cohen's *d* values (Cohen, 1988, 1992) to indicate effect size. Variables that changed significantly from baseline to 6 months are bolded. Eight of 12 SR variables changed significantly. They were beliefs, private SR practices, daily spiritual experiences, the three-item Fetzer Institute/National Institute on Aging forgiveness measure, both Mauger measures (forgiveness of self and of others), negative religious coping, and purpose in life. As Cohen's *d* indicates, these effects were small. Changes in forgiveness of self and negative religious coping had the largest effect sizes, which foreshadowed the following findings on their relationship to drinking outcomes.

Linear regressions predicting 9-month drinking

Table 3 presents the results of the individual multiple linear regressions predicting PDA and DSLD, from 6-month change in an SR variable, controlling for baseline AAI and drinking (PDA and DSLD, respectively). Both PDA and

TABLE 2. SR variables at baseline and 6 months: Means, standard deviations, *p* values from paired samples *t* test, and Cohen's *d*

Scale and range of possible scores	6		<i>n</i>	<i>p</i>	<i>d</i>
	Baseline <i>M</i> (<i>SD</i>)	months <i>M</i> (<i>SD</i>)			
Loving God scale, 0–30	25.3 (4.3)	25.5 (4.3)	269	.406	–
Controlling God scale, 0–30	10.8 (5.9)	10.6 (5.9)	270	.696	–
Beliefs, 1–5	3.80 (1.2)	3.89 (1.1)	316	.032	0.075
Private SR practices, 5–37	16.0 (7.7)	17.0 (7.8)	316	.000	0.130
Daily spiritual experiences, 16–94	53.8 (17.5)	56.0 (18.5)	316	.000	0.126
Meaning, values, beliefs, 6–24	17.3 (3.7)	17.6 (3.6)	316	.056	0.081
Fetzer forgiveness, 3–12	9.0 (1.9)	9.2 (2.0)	316	.010	0.105
Mauger forgiveness of self, 0–15	7.3 (3.8)	8.3 (4.0)	316	.000	0.263
Mauger forgiveness of others, 0–15	10.26 (3.2)	10.79 (3.1)	316	.000	0.166
Positive religious coping, 10–40	23.0 (7.9)	23.3 (8.5)	316	.244	–
Negative religious coping, 8–32	12.9 (3.9)	11.9 (3.5)	316	.000	-0.256
Purpose in life, 20–140	92.1 (18.5)	95.4 (19.0)	313	.000	0.178

Notes: Differences between time points analyzed with paired-sample *t* tests. *d* = Cohen's *d* values (1988, 1992) provided for SR variables with significant change. SR = spirituality and religiousness. Variables that changed significantly from baseline to 6 months are highlighted in **bold**.

DSLD were predicted by increases in private SR practices, daily spiritual experiences, forgiveness of self, and purpose in life. Changes in three SR variables (Fetzer forgiveness, forgiveness of others, and negative religious coping) predicted PDA or DSLD. Changes in these SR variables were associated with favorable change in drinking outcomes, with the notable exception of forgiveness of others, which was negatively associated with PDA. Note that a drop in negative religious coping was favorable. Predictive relationships were not found for the SR variables of beliefs and meaning, values, and beliefs.

Logistic regressions predicting 9-month drinking

Table 4 presents the results of the individual multiple logistic regressions predicting PHDD and DDD. The table includes the significant and marginally significant odds ratios. Both PHDD and DDD were predicted by increases in private SR practices and forgiveness of self and decreases in negative religious coping. The odds of any PHDD were also lower with increases in the Fetzer forgiveness scale and purpose in life. Increases in daily spiritual experiences significantly predicted reduced odds of any drinking (i.e., DDD). Again, no significant relationships were found in these logistic regressions for beliefs and for meaning, values, and beliefs, as well as for forgiveness of others.

TABLE 3. Significant multiple linear regressions predicting 9-month percentage of days abstinent (PDA) and mean days since last drink (DSLDD) from 6-month change in each spirituality and religiousness (SR) variable, controlling for baseline drinking and baseline Alcoholics Anonymous Involvement scale

Measures	PDA in last 90 days		DSLDD	
	<i>b</i>	<i>p</i>	<i>b</i>	<i>p</i>
Beliefs	—	—	—	—
Private SR practices	1.223	.001	5.815	.000
Daily spiritual experiences	0.382	.017	2.489	.000
Meaning, values, beliefs	—	—	—	—
Fetzer forgiveness	—	—	10.891	.013
Mauger forgiveness of self	1.290	.024	11.232	.000
Mauger forgiveness of others	-1.500	.036	—	—
Negative religious coping	—	—	-5.067	.036
Purpose in life	0.301	.020	1.733	.002

Notes: Analyses were conducted only for those SR variables that changed significantly at $p < .10$. Data for multivariable models significant at $p \leq .05$ are in **bold**. *b* = unstandardized *b*.

Adding treatment exposure (i.e., treatment days from baseline to 6 months) or desire to be abstinent as control variables did not alter the basic nature of these results, although the significance of some dropped to the trend level, particularly with the logistic analyses.

Discussion

In a larger and more diverse sample, we again found many SR dimensions changing in alcoholics over the course of 6 months, although the specific SR dimensions differed somewhat from prior findings (Robinson et al., 2007). We found significant change in 8 of 12 quantitative measures of SR, specifically beliefs, daily spiritual experiences, private SR practices, forgiveness (overall, of self, and of others), negative religious coping, and purpose in life or sense of meaning. Significant changes were not found in perceptions of God and positive religious coping, although marginally significant changes were found in meaning, values, and beliefs.

Furthermore, 6-month changes in several of these SR variables were predictive of 9-month drinking outcomes, controlling for baseline AA involvement and drinking. Increases in forgiveness of self and private SR practices were the most consistent predictors, predicting all four drinking variables at 9 months. Increases in daily spiritual experiences and purpose in life and decreases in negative religious coping significantly predicted three of four drinking outcomes. Increases in the brief global measure of forgiveness (Fetzer Institute/National Institute on Aging, 1999) predicted two outcomes; however, increases in forgiveness of others negatively predicted only one outcome. Increases in beliefs and meaning, values, and beliefs did not predict any outcomes.

TABLE 4. Significant multiple logistic regressions predicting 9-month dichotomized percentage heavy drinking days (PHDD) and mean drinks per drinking day (DDD) from 6-month change in each spirituality and religiousness (SR) variable

Measures	PHDD in last 90 days		DDD in last 90 days	
	OR	<i>p</i>	OR	<i>p</i>
Beliefs	—	—	—	—
Private SR practices	0.945	.043	0.936	.016
Daily spiritual experiences	0.977	.066	0.969	.011
Meaning, values, beliefs	—	—	—	—
Fetzer forgiveness	0.831	.017	0.867	.061
Mauger forgiveness of self	0.857	.001	0.858	.001
Mauger forgiveness of others	—	—	—	—
Negative religious coping	1.095	.039	1.123	.008
Purpose in life	0.974	.009	0.982	.063

Notes: Controlling for baseline drinking variable and baseline Alcoholics Anonymous Involvement scale. Analyses were conducted only for those SR variables that changed significantly at $p < .10$. Data for multivariable models significant at $p \leq .05$ are in **bold**. Data for models that approach significance are included but are not in bold. OR = odds ratio.

The current analyses provide evidence that SR change reinforces and supports subsequent reductions in drinking. Specifically, increases in forgiveness of self and private SR practices were consistent predictors of 9-month outcomes. For each unit increase in forgiveness of self (note the average change was 1 point or unit), PDA increased by 1.3 percentage points, DSLDD increased by 11.2 days, and the odds of a heavy drinking day or any drinking were 14% less likely at 9 months. Similarly for private SR practices, which also changed 1 point on average, PDA increased by 1.2 percentage points, DSLDD increased by 5.8 days, and participants were 6% and 7% less likely to engage in heavy drinking and any drinking, respectively.

Forgiveness

Although our earlier study found that increases in the global measure of forgiveness from the Fetzer Institute/National Institute on Aging (1999) were not associated with outcomes, this study found increases in forgiveness of self and overall forgiveness to be predictive of drinking outcomes. The findings on the importance of forgiveness of self are congruent with other studies. Several studies have documented that, among those with alcohol problems (Webb and Brewer, 2010; Webb et al., 2006), forgiveness of self versus forgiveness of others and feeling forgiven by God were the least endorsed dimensions of forgiveness. Two other studies have found evidence of the relative importance of forgiveness of self in alcohol outcomes (Webb et al., in press, submitted for publication-b). Webb et al. (in press) found that, at baseline, 6-month follow-up, and longitudinally (baseline to 6 months), forgiveness was associated with lower alcohol use and problems, indirectly through mental health. Baseline forgiveness of self and forgiveness of others were both

individually associated with multiple drinking outcomes. At 6-month follow-up and longitudinally, relationships were found only for the outcome of alcohol problems and for forgiveness of self or forgiveness of others. Similarly, Webb et al. (submitted for publication-b) describe cross-sectional findings of salutary associations between alcohol outcomes and forgiveness of self (largely through mental health) and feeling forgiven by God (only directly). Webb and colleagues (in press) argue that forgiveness of one's self may be the most important dimension of forgiveness in substance use disorders and recovery, as compared with forgiveness of others and by God. Our results are congruent with that suggestion.

Our findings on forgiveness of others are surprising, particularly given that clinicians and many in recovery advocate efforts to forgive others. AA's central text, *Alcoholics Anonymous*, states that "resentment is the 'number one' offender" (AA, 1976, p. 64). However, if AA involvement is the primary contributor toward forgiveness of others, this analysis would obscure this relationship, because we controlled for AA involvement. To check, we ran the analyses without controlling for AA involvement and found no significant relationships between drinking outcomes and forgiveness of others. Our results are also incompatible with the work of Lin et al. (2004). They contrasted two therapies designed to augment the usual treatment received by individuals in a residential alcohol/drug treatment center: forgiveness (of others) therapy and treatment as usual. The forgiveness (of others) therapy was found to more effectively reduce a variety of negative emotions and vulnerability to substance use; no data were collected on actual behaviors. Our post hoc analysis without controlling for AA involvement and the Lin et al. study (2004) make us doubt that this finding of a negative relationship between increases in forgiveness of others and one drinking variable will hold up in future research.

We might speculate that effective change in forgiveness of others may develop more slowly during recovery, particularly without AA involvement. Forgiveness of others may be more effective after one has begun to forgive one's self, later in the recovery process, or with AA involvement. We may also find, as have others, that mental health status may play a role in forgiving others (Webb et al., 2009, in press, submitted for publication-b).

In sum, although research supports multiple dimensions of forgiveness as factors in substance use disorders and recovery, it appears that forgiveness of self may be most important, particularly in the first 6 months of recovery. Indeed, whereas the Big Book (AA, 1976) discusses the central role of resentments and the resolution of grudges, which are commonly conceptualized as interpersonal concerns, the Big Book also discusses the value of forgiveness of self. This evidence of the importance of forgiveness of self, although not overlooking the importance of other dimensions, may require a shift in attention in treatment and prevention.

Private spiritual and religious practices

The consistency of our finding that increases in private SR practices predict drinking outcomes suggests that SR-related behaviors, such as prayer, meditation, and reading, may be relevant to improved outcome. Note that this is a measure of private religious practices, not involvement with a religious congregation or worship with others. These findings provide support for the anecdotal reports of recovering alcoholics that prayer and other practices support their sobriety, in this case without involvement in AA. This is the most behavioral of our SR measures. In our previous cross-sectional analysis, we had found that private practices were not associated with drinking outcomes, which led us to speculate that early changes in SR dimensions relevant to drinking may be primarily cognitive. However, these results suggest that behaviors, specifically private SR practices, may also support initial sobriety.

Negative religious coping

Decreases in negative SR coping strategies that assume a judgmental, condemning, or abandoning deity are associated with improved drinking outcomes at 9 months. Although at baseline few respondents strongly endorsed feeling abandoned and/or punished by God, those whose scores improved (i.e., endorsing fewer negative coping strategies 6 months later) were drinking less at 9 months. Decreases in this dimension rest on shifting to a more benevolent perception of and relationship to a deity.

Daily spiritual experiences

As we reported in our previous article (Robinson et al., 2007), it appears that changes in experiences of day-to-day spirituality may be important in recovery. Increases in perceptions of connection to God and of receiving strength, comfort, and love from God, as well as experiences of peacefulness and awe, are associated with less subsequent drinking. Again, because this finding is based on controlling for AA involvement, the catalyst for this increase is unclear. It may be a consequence of increases in private SR practices.

Purpose in life

Sense of meaning/purpose in life was again confirmed to be an important issue for alcoholics as they recover, because increases remain a predictor of subsequent drinking outcomes (for at least three of four outcomes). It may be intuitively obvious that, as alcoholics become sober, an increase in the sense that one's life has meaning might provide motivation to sustain sobriety. However, the causal connection and the mechanisms behind this relationship are

not empirically obvious. Interventions specifically targeted at increasing recovering alcoholics' sense of meaning/purpose in their lives, such as logotherapy (Frankl, 1992), might help to determine how this factor affects recovery.

Alcoholics Anonymous involvement

We controlled for AA involvement because of its strong association with SR and sobriety, which allowed us to identify the impact of non-AA-related SR change. However, the relationship between SR change and AA involvement was thereby obscured, making it harder to answer questions about the nature of AA involvement that leads to SR change and which dimensions of SR are most affected by such involvement. Subsequent analyses should investigate how AA involvement affects various dimensions of SR, particularly because AA-mediated SR change is probably the most common type of SR change among alcoholics.

A panel study cannot definitively clarify causal relationships; however, we found that SR change appears to reinforce and support reductions in drinking frequency and quantity, regardless of AA involvement. Given the pervasiveness of the 12-step model in the context of contemporary recovery, it is striking that SR change has an independent relationship with subsequent drinking patterns. In many ways, we set a fairly conservative test of the impact of SR change, because we controlled for the factor most commonly thought to alter SR among alcoholics. Our findings suggest that alcoholics who are decreasing their drinking without AA find ways of supporting and nurturing their SR. From a clinical perspective, this is a reminder that non-AA-mediated SR change occurs and that supporting positive shifts in clients' SR may be helpful, regardless of whether the context for that shift is within AA. Further work may show that SR change is a component of natural recovery (Sobell et al., 2000).

Limitations and future directions

This study was limited in drawing its sample from only one geographic area, the Midwest of the United States, and it is known that there are striking geographic differences in religiousness (Pew Forum on Religion and Public Life, 2008). In addition, this was hardly a representative sample of alcoholics, treated or untreated, because the NESARC data (Cohen et al., 2007; Dawson et al., 2007) have indicated that the field's treatment samples do not represent the vast majority of alcoholics. Even with the inclusion of some untreated alcoholics, the generalizability of this study to all alcoholics is therefore limited, particularly in applying its findings to ethnic minorities and other specific populations. In terms of the measures used in this study of our SR constructs, the majority of the measures are robust. Nevertheless, there are many questions that may be answered only through qualitative data collection and analysis, such as the idiographic

nature of alcohol-dependent individuals' spiritual and religious cognitions and life experiences. Lastly, the time span between SR change and subsequent outcomes may be short by some standards, suggesting the need to confirm this relationship using a longer time span.

Further work is needed to replicate these findings and, in particular, to examine the specific roles of the SR dimensions, which we found to be predictive of subsequent drinking outcomes—forgiveness of self, private religious practices, overall forgiveness, purpose in life, daily spiritual experiences, and negative religious coping. Although this evidence suggests that some SR changes affect subsequent drinking, the causal relationship may be more indirect (i.e., through other variables, such as health behaviors, interpersonal functioning, social support, and/or mental health; Webb and Trautman, 2010; Webb et al., in press, submitted for publication-a, submitted for publication-b; Worthington et al., 2001). We may also speculate that reductions in drinking may lead to increases in SR and that the relationship is bi-directional.

Although the effects of SR change on subsequent drinking, independent of AA involvement, appear modest, the persistence of these findings suggests that SR does play a role in substance use disorders and recovery. Cross-sectional and longitudinal data suggest, at the least, an interaction between SR and reductions in alcohol use. It is valuable to find that reductions in drinking and subsequent suffering are associated with change in several SR dimensions (forgiveness of self, private religious practices, overall forgiveness, daily spiritual experiences, purpose in life, and negative religious coping). Further work is needed to examine how change in these SR dimensions affects dependence and recovery among alcoholics.

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