

Six-Month Changes in Spirituality, Religiousness, and Heavy Drinking in a Treatment-Seeking Sample*

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ABSTRACT. Objective: This descriptive and exploratory study investigated change in alcoholics' spirituality and/or religiousness (S/R) from treatment entry to 6 months later and whether those changes were associated with drinking outcomes. **Method:** Longitudinal survey data were collected from 123 outpatients with alcohol use disorders (66% male; mean age = 39; 83% white) on 10 measures of S/R, covering behaviors, beliefs, and experiences, including the Daily Spiritual Experiences and Purpose in Life scales. Drinking behaviors were assessed with the Timeline Followback interview. Alcoholics Anonymous (AA) participation and attendance were also measured. **Results:** Over 6 months, there were statistically significant increases in half of the S/R measures, specifically the Daily Spiritual Experiences scale, the Purpose in Life scale, S/R practices scale, Forgiveness scale, and the Positive Religious Coping scale. There were also clinically and statistically significant de-

creases in alcohol use. Multiple logistic regression analyses showed that increases in Daily Spiritual Experiences and in Purpose in Life scores were associated with increased odds of no heavy drinking at 6 months, even after controlling for AA involvement and gender. **Conclusions:** In the first 6 months of recovery, many dimensions of S/R increased, particularly those associated with behaviors and experiences. Values, beliefs, self-assessed religiousness, perceptions of God, and the use of negative religious coping did not change. Increases in day-to-day experiences of spirituality and sense of purpose/meaning in life were associated with absence of heavy drinking at 6 months, regardless of gender and AA involvement. The results of this descriptive study support the perspective of many clinicians and recovering individuals that changes in alcoholics' S/R occur in recovery and that such changes are important to sobriety. (*J. Stud. Alcohol Drugs* 68: 282-290, 2007)

MANY ADDICTION CLINICIANS, recovering persons, and clergy have experienced, observed, and promoted changes in spirituality and/or religiousness (S/R) as important, if not crucial, components of successful recovery. However, there are few empirical studies of S/R changes among patients with alcohol use disorders, particularly studies that investigate multiple dimensions of S/R and their possible contributions to recovery. In this naturalistic study, we examined 6-month changes in 10 S/R dimensions in a sample of alcoholics entering treatment and whether changes in S/R dimensions would be associated with absence of heavy drinking.

Empirically studying S/R inevitably raises definitional and operational issues. Our conceptual definitions of S/R are based on current psychology of religion literature (Fetzer Institute/National Institute on Aging [NIA], 1999; Larson et al., 1998; Pargament, 1999; Zinnbauer et al., 1997), cul-

tural perspectives (e.g., Fuller, 2001; Lesser, 1999), and pilot work with clinicians and recovering persons (Robinson et al., 2003). Spirituality is defined as a person's feelings, thoughts, experiences, and behaviors that arise from a search for and connection to the sacred, defined broadly to include not only a divine being but also ultimate reality, transcendent truth, or existential meaning. This definition encompasses both theistic and nontheistic perspectives (Webb, 2003). Religiousness is defined as a person's participation in a specific social context related to that search and connection (i.e., social institutions, rituals, and prescribed behaviors), usually tied to a particular belief system and cultural context. Miller and Thoresen (1999) distinguished these concepts by emphasizing the individual and personal nature of spirituality versus the collective and institutional quality of religion. S/R is generally considered to be multidimensional in nature (e.g., Fetzer Institute/NIA, 1999), comprising behaviors (e.g., prayer, church attendance, and religious affiliation), beliefs (e.g., in a personal God and an afterlife), and experiences (e.g., feeling close to God, having a sense of peace, joy, and connection to nature and to others). Although formal religious participation and affiliation are easier to define and measure than spiritual experiences, there are a growing number of psychometrically sound measures of spirituality (e.g., Fetzer Institute/NIA, 1999; Hill and Hood, 1999; Hood, 1975; Hood et al., 2001; Knoblauch and Falconer, 1986), including some that have

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been assessed in a national sample (Fetzer Institute/NIA, 1999).

Examples of qualitative evidence linking spiritual changes and recovery from alcoholism include the historical analyses of Kurtz (1979), the in-depth interviews of Miller and C'de Baca (2001), and stories from the recovery community (Alcoholics Anonymous [AA], 2001). Other evidence is implied by the empirical evidence of the effect of interventions with spiritual components, specifically AA (e.g., Connors et al., 2001a; Emrick et al., 1993; Tonigan et al., 1996b) and 12-step facilitation therapies (Project MATCH Research Group, 1997, 1998).

More direct evidence associating spiritual change with sobriety in recovering persons comes from studies examining purpose or meaning in life. Many researchers (Brown et al., 1998; Carroll, 1993; Crumbaugh, 1968; Crumbaugh and Maholick, 1964; Noblejas de la Flor, 1997; Jacobson et al., 1977) have found that perceptions of meaning or purpose in life are low among alcoholics entering treatment compared with normative samples. Both Noblejas de la Flor (1997) and Carroll (1993) found a cross-sectional relationship between length of sobriety and greater sense of purpose in life. Using a longitudinal design, Waisberg and Porter (1994) reported that 4 months after treatment entry, purpose in life had increased significantly among treated alcoholics compared with their baseline and with controls who were placed on a waiting list. Furthermore, 4-month levels of purpose in life were predictive of drinking and drug-use status at follow-up.

Although Project MATCH (Matching Alcoholism Treatments to Client Heterogeneity) collected data on several S/R variables, published analyses have focused mostly on the contribution of baseline values to treatment matching (Longabaugh and Wirtz, 2001) rather than changes in these variables and their association with follow-up drinking behaviors. Tonigan and colleagues (2001) reported that baseline meaning seeking was not predictive of subsequent abstinence. On the other hand, Connors and colleagues (2001b) found modest correlations between baseline religious beliefs and practices and percentage days abstinent at 4-15 months posttreatment. Using data from all Project MATCH subjects who had attended an AA meeting, Tonigan and colleagues (2000) combined posttreatment AA involvement, attendance, perceived helpfulness, and AA-mediated spiritual awakening with the God consciousness subscale of their measure of religious beliefs and practices into a single latent variable. This resulting variable was associated with abstinence at 10-15 months. However, no information was presented on changes over time in these variables or the particular contribution of the specifically S/R components of this latent variable (i.e., spiritual awakening and God consciousness) to subsequent alcohol use.

Another analysis of Project MATCH data investigated whether belief in God was associated with AA involve-

ment and with drinking outcomes (Tonigan et al., 2002). Atheists and agnostics were less likely to be involved in AA than clients who believed in God but as likely to be sober. The 12-step facilitation treatment condition was associated with a greater shift toward belief in God than cognitive-behavioral therapy and motivational-enhancement therapy. Although the predicted association between AA attendance and decreased alcohol use was found, this association was not influenced by beliefs about God. These findings match those of Winzelberg and Humphreys (1999), who also found no evidence that belief in God and religious behaviors in the past year related to abstinence at follow-up in a longitudinal sample of Veterans Affairs substance-disordered patients.

Tonigan (in Owen et al., 2003) found that experiences of AA-mediated spiritual awakening did not predict abstinence or its association with AA participation. Kaskutas and colleagues (2003) investigated the same S/R variables longitudinally in several treatment samples and found similarities and differences with the above results. Specifically, experiences of spiritual awakening due to AA involvement were significantly associated with being abstinent at Year 3. However, belief in God was not associated with abstinence after controlling for other relevant variables.

A cross-sectional survey by Zemore and Kaskutas (2004) described the relationship between helping activities, spirituality, and length of sobriety in a sample of abstinent alcoholics. With longer lengths of sobriety, daily experiences of God and spirituality increased, as did helping in the larger community, although recovery helping decreased.

Piedmont (2004) reported that experiences of spiritual transcendence in a sample drawn from a substance use-disorder treatment program increased from baseline to 8 weeks, and baseline levels were predictive of posttreatment coping resources, psychiatric distress, and counselors' ratings of treatment success. None of the outcome measures included substance use.

Thus, there is some basis for proposing that dimensions of S/R change as individuals address alcohol problems and that these changes might be associated with sobriety, especially in the dimension of meaning or purpose in life. It also appears that beliefs are not likely to change, at least within the time spans studied to date. However, practices and spiritual experiences may increase and spiritual awakenings may occur, although the contribution of these dimensions to sobriety is unknown.

A better understanding is needed of the "natural history" of S/R changes in alcoholics who are attempting recovery. We conducted a naturalistic study of recovery using a longitudinal survey design with a sample of individuals recruited on entry into alcohol treatment. This article presents the analysis of two primary research questions: (1) which, if any, dimensions of S/R increase in the first 6 months after individuals begin an effort to recover from an

alcohol problem? and (2) are significant increases in an S/R dimension associated with decreased alcohol use at 6 months?

Method

Design and procedure

This was a descriptive longitudinal survey of individuals with diagnoses of alcohol use disorders entering outpatient substance-disorder treatment. At the study's baseline and 6 months later, we measured 10 dimensions of S/R as well as drinking behavior, AA participation, and other relevant demographic and clinical variables. The project was reviewed and approved by the appropriate institutional review board.

Criteria for recruitment were that respondents (1) be 18 years of age or older; (2) be diagnosed by the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (First et al., 1997), as having a lifetime diagnosis of alcohol abuse or dependence; (3) not be a danger to themselves or others; and (4) recently began an episode of outpatient treatment (1-4 weeks of treatment; i.e., after some engagement and detoxification but early in the treatment episode). Treatment predominantly used 12-step facilitation techniques, with limited use of cognitive-behavioral approaches and motivational interviewing. After identifying potential respondents by clinical-record review, respondents were recruited by the senior author or research assistants. Respondents provided written informed consent and were paid for their participation. A total of 240 eligible individuals were approached, of which 157 (65.4%) agreed to participate. As the study was identified within the treatment agency as the "Spirituality Study," it is possible that individuals with low interest or high discomfort with this topic were less likely to participate. One may reasonably speculate that nonparticipants were more likely to be religiously alienated, younger, and male and to have antisocial personality disorder. Formal analysis of the differences between study participants and nonparticipants is not possible, because data on nonparticipants was not retained. Three individuals who were found to have no alcohol use for more than a year before the baseline interview were excluded from this analysis, yielding a final baseline sample of 154.

Sample

About two thirds of the sample were male (66.2%), the average age was about 39 years, the mean years of education was almost 14, and nearly 40% were married or cohabitating with a partner (Table 1). The sample's ethnicity reflected the local community, with about 83% being white, 15% being black, and the remainder being other ethnicities.

TABLE 1. Demographic characteristics at baseline ($N = 154$)

Variable	% or mean (SD)
Gender	
Male	66.2%
Female	33.8%
Age, in years	38.8 (13.8)
Education, in years	13.8 (2.3)
Marital status	
Married/cohabitating	39.0%
Never married	35.7%
Separated	7.1%
Divorced	16.2%
Widowed	2.0%
Ethnicity	
White	82.5%
Black	14.9%
Hispanic	1.3%
Native American	1.3%
Employment status	
Full time	55.2%
Part time	15.6%
Unemployed ^a	29.2%

^aIncludes retired, disabled, and students.

More than half (55.2%) of the sample was employed full time. Of those who were unemployed, 24% were retired, 18% were disabled, and 11% were students.

Most respondents (92%) had a lifetime diagnosis of alcohol dependence; the remainder (8%) were diagnosed with alcohol abuse. Two thirds (66%) of those with alcohol dependence were classified as severe (meeting six to seven diagnostic criteria), 21% were moderate (five criteria), and only 13% were mild (three to four criteria). Mean (SD) age of onset of dependence was 26 (12) years. Almost three quarters of the sample (73%) had prior treatment.

Of the 154 participants who completed the baseline interview, 123 (80%) completed the 6-month interview at a mean of 6.7 (1.2; range: 5.2-11.7) months after baseline. Attrition analyses (Menard, 1991) showed no significant differences at baseline between those who did and did not participate in the 6-month interview on gender, age, education, marital status, ethnicity, employment, alcohol diagnosis, or alcohol-use variables. Of the 10 S/R measures, described more fully below, only the belief item from the Religious Background and Behaviors scale differed significantly at baseline between those who did and did not participate in the follow-up interview. Both followed and not-followed participants on average believed in God at baseline, but followed participants were more likely to be nonreligious, whereas not-followed participants were more likely to be religious.

Measures

Data on alcohol use during the 90 days before the baseline interview were obtained with the Timeline Followback Interview (Sobell and Sobell, 1992).

Respondents, with the interviewer, filled out a calendar specifying the number of standard drinks consumed on each day over the last 90 days. From this measure, the following variables were obtained: percentage days abstinent, percentage heavy drinking days, mean drinks per drinking day, and number of days since last drink. At baseline, percentage days abstinent in the last 90 days was 69%, percentage heavy drinking days was 27%, and mean drinks per drinking day was eight. The average number of days since last drink was 44, which reflects that respondents had been in treatment for 1-4 weeks before the baseline interview as well as the fact that many had stopped drinking before treatment entry. Heavy drinking was defined as five or more drinks in a day for men or four or more drinks in a day for women. Negative consequences due to alcohol problems were assessed with the Short Index of Problems scale (Miller et al., 1995). The mean Short Index of Problems score of 21 (12) indicated a medium level of alcohol problems.

S/R measures were drawn from published measures used in Project MATCH and the psychology of religion literature, including the Brief Multidimensional Measure of Religiousness and Spirituality (BMMRS; Fetzer Institute/NIA, 1999). Higher scores on all S/R variables indicated higher levels of the variable.

Perceptions of God were assessed with the Loving and Controlling God Scales (Benson and Spilka, 1973). This semantic differential is composed of two 5-item scales: perceptions of God as loving (Loving God Scale) and perceptions of God as controlling (Controlling God Scale). Each scale consisted of five bipolar items that asked participants to indicate their perceptions of God on a 0-6 scale (e.g., 0 = loving, 6 = hating). The Loving God Scale had Cronbach's α coefficients of .75 and .78 at baseline and 6 months, respectively. The Controlling God Scale had poor reliability with α coefficients of .66 at baseline, which dropped to .55 at 6 months.

Beliefs and religious/spiritual practices were measured with two components of the Religious Background and Behaviors scale (Connors et al., 1996), used in Project MATCH. Beliefs were assessed with the first item in this scale, which quantified the degree that respondents believe in God and practice religion. The mean on this 5-point item was 4.1 (1.1) (4 = "I believe in God, but I'm not religious"), which was congruent with other indicators in the data (e.g., religious preference, congregational involvement, and self-ranking of one's S/R), suggesting that the respondents generally considered themselves spiritual but not religious. S/R practices were assessed by the 6-item formal-practices component of the Religious Background and Behaviors scale. These items assessed the frequency of prayer, meditation, worship-service attendance, reading of scriptures, and experiences of God on an 8-point response scale ranging from never to more than once a day. The

practices subscale had α coefficients of .82 and .82 at baseline and 6 months, respectively.

Daily Spiritual Experiences (Underwood and Teresi, 2002) measured such experiences as a sense of connection with and strength, comfort, and love from God; a sense of wholeness 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. Item scores were summed to yield a measure of frequency of these spiritual experiences. Baseline and 6-month α 's for this study were .92 and .92, respectively. Using this measure of daily experiences of spirituality and God, Zemore and Kaskutas (2004) found two factors in an exploratory factor analysis, whereas an exploratory factor analysis of our data showed a one-factor solution, as found by Underwood and Teresi (2002).

Six items from the BMMRS measured values and beliefs such as a sense of underlying meaning in one's life, the importance of carrying one's beliefs into all areas of one's life, one's responsibility for reducing others' suffering, and belief in a personal God. This Meaning, Values, and Belief scale had baseline and 6-month α 's of .79 and .74, respectively.

Forgiveness was measured with a 3-item Forgiveness scale from the BMMRS. The items asked about forgiving others and one's self and feeling forgiven by God. Responses were on a 4-point scale from never to almost always. Baseline and 6-month α 's for our study were very low, .47 and .54, respectively, which is perhaps not surprising given the low number of items and the disparate domains assessed.

The use of positive and negative religious coping was measured with an adaptation of Pargament et al.'s (1998) Brief RCOPE, which assessed coping strategies that use spiritual and religious cognitive constructs. The Positive Religious Coping scale reflects perceptions of a secure relationship with God; a belief that there is meaning in life; and a sense of spiritual connectedness to others through benevolent reappraisals, collaborative religious coping, seeking spiritual support and connection to God and others, purification, and religious forgiveness. Negative religious coping reflects an insecure and untrusting relationship with God, perceptions of God as judge and punisher, an ominous view of the world and one's place in it, and a struggle for significance and meaning. Response options on the 16 items range on a 4-point scale from not at all to a great deal. The Positive Religious Coping scale had baseline and 6-month α 's of .93 and .94, respectively, and the Negative Religious Coping scale had baseline and 6-month α 's of .83 and .83, respectively.

Existential meaning and purpose was measured with Crumbaugh and Maholick's (1964) Purpose in Life scale. Based on Frankl's existential perspective (1959, 1963), it assesses the degree that an individual has a sense of meaning

or significance of life. This 20-item measure has 7-point Likert response scales. In our sample, both the baseline and 6-month α 's were .88.

AA participation was assessed with the AA Involvement Scale (Tonigan et al., 1996a), which includes attendance data (lifetime and past year) and an involvement subscale. The latter subscale has 9 items with yes/no responses on AA activities, such as having a sponsor, sense of being a member of AA, and celebrating a sobriety birthday. We added an additional item on AA service. Baseline and 6-month α 's for the AA involvement subscale were .82 and .81, respectively. Both baseline attendance measures were highly skewed. Lifetime attendance ranged from 0 to 5,000, with a mean of 210.5 (614.9) and a median of 25.0. Attendance in the last year ranged from 0 to 300, with a mean of 32.0 (50.8) and a median of 10.0. Based on the follow-up sample ($n = 123$), AA involvement scores increased significantly from baseline to 6 months, from 13.0 to 14.0 ($t = -5.81, p < .001$; Cohen's $d = 0.39$). Number of meetings in the last year also increased from 31.5 to 82.4 ($t = -7.56, p < .001$) as did number of meetings ever attended, from 181.9 to 264.2 ($t = -4.05, p < .001$).

All S/R, alcohol-use, and alcohol-consequences measures were assessed again 6 months after the baseline.

Analysis plan

The distribution of variables, particularly their skewness, was examined to determine if assumptions of normality in statistical tests would be violated. Our analyses next proceeded in two stages: testing for change over time and examining the relationship between 6-month drinking variables and S/R changes. We first examined the significance of changes in S/R and clinical variables from baseline to 6 months using paired sample t tests. Those S/R variables that changed significantly over the 6 months were then tested as statistical predictors of heavy drinking at 6 months, using multiple logistic regression analyses, controlling for baseline heavy drinking, gender, and AA involvement. As described in more detail below, because of extreme skewness in the alcohol-use variable of heavy drinking at 6 months, heavy drinking days was dichotomized as few individuals had relapsed to heavy drinking, thereby requiring the use of multiple logistic regression.

Results

Table 2 presents the analysis of change from baseline to 6-month follow-up on the major quantitative S/R variables. Half of the S/R variables changed significantly from baseline to 6 months later. Specifically, S/R practices, Daily Spiritual Experiences, Forgiveness, Positive Religious Coping, and Purpose in Life all increased. However, changes were not significant in the Loving and Controlling God Scales;

TABLE 2. Changes in spirituality/religiousness (S/R) from baseline to 6-month follow-up

S/R dimension	Baseline Mean (SD)	6 month Mean (SD)	t	d
Loving God Scale	24.8 (4.6)	24.3 (5.1)	-1.60	-0.12
Controlling God Scale	11.6 (6.2)	11.7 (5.1)	0.33	0.03
Beliefs	4.0 (1.1)	4.1 (1.1)	1.68	0.09
S/R practices	23.1 (9.1)	26.1 (9.3)	4.95[†]	0.33
Daily Spiritual Experiences	58.8 (17.6)	62.0 (16.1)	2.57*	0.19
Meaning, Values, Beliefs	18.0 (3.2)	18.3 (2.9)	1.38	0.10
Forgiveness	9.5 (1.7)	9.9 (1.5)	2.74[†]	0.24
Positive Religious Coping	25.5 (7.8)	26.6 (7.7)	2.22*	0.14
Negative Religious Coping	13.0 (4.3)	12.4 (4.3)	-1.92	-0.14
Purpose in Life	96.2 (16.4)	100.3 (15.2)	2.97[†]	0.26

Notes: Results from paired-samples t tests. Degrees of freedom ranged from 116 to 122. Bolded rows indicate significant differences over time. d = Cohen's d .

* $p < .05$; $^{\dagger}p < .01$.

the Religious Background and Behaviors belief item; and the BMMRS Meaning, Values, and Beliefs scale. A decrease in Negative Religious Coping approached significance ($p = .06$). Behaviors and experiences were more likely to change than were beliefs about God and one's self-labeled religiousness, S/R values and assumptions, and perceptions of God. Using guidelines proposed by Cohen (1992), these effect sizes may be interpreted as small to moderate. However, because this is the first study to report effect sizes for change in S/R variables over time in this population, the classification of the magnitude of these effects awaits future research.

All measures of alcohol use and consequences of alcohol use showed significant reductions over time, as tested by paired sample t tests (see Table 3). The mean percentage days abstinent in the last 90 days increased from 68.8% to 91.0% ($t = -8.36, p < .001$), mean percentage of heavy drinking days dropped from 26.8% to 5.4% ($t = 8.51, p < .001$), mean number of drinks per drinking day also dropped from a mean of 8.4 drinks to 3.3 ($t = 5.62, p < .001$), and days since last drink increased from a mean of 43.7 days to 141.9 ($t = -10.65, p < .001$). Consequences of alcohol use, as measured by the Short Index of Problems scale, decreased from a mean score of 21.4 to 7.4 ($t = 11.3, p < .001$). Notice that at 6 months, all but days since last drink and the Short Index of Problems scale had relatively high skewness scores.

Our next analysis focused on the key question of whether change in any S/R domain was a statistical predictor of 6-month drinking behaviors. S/R change scores were calculated by subtracting the baseline value from the 6-month value for each S/R variable. We initially chose percentage of days heavy drinking in the last 90 days as our primary drinking outcome measure, recognizing the increased advocacy and use of this outcome variable in the alcohol-research literature (Sobell et al., 2003) as well as its use as an outcome measure in Project MATCH. However, because 72% of respondents had not relapsed to heavy drinking at

TABLE 3. Mean, standard deviation, standard error, and skewness of clinical variables at baseline and 6 months

Variable	Baseline			6 months		
	Mean (SD)	SE	Skewness	Mean (SD)	SE	Skewness
Percentage days abstinent in last 90 days	68.80 (27.03)	2.41	-0.48	90.99 (19.84)	1.79	-2.71
Percentage heavy drinking days in last 90 days	26.79 (27.06)	2.41	0.69	5.36 (14.39)	1.30	3.58
Mean number of drinks per drinking day in last 90	8.42 (6.08)	0.54	0.66	3.28 (8.92)	0.80	7.58
Days since last drink	43.72 (45.82)	3.78	2.32	141.86 (115.42)	10.41	0.13
Short Index of Problems	21.36 (12.25)	1.13	0.15	7.39 (10.51)	0.95	1.88

Notes: Differences between baseline and 6-month variables are all significant at $p < .001$ with paired-samples t tests. Degrees of freedom ranged from 116 to 122.

6 months, this variable was highly skewed as indicated by a skewness statistic of 3.58. (See Table 3.) We therefore created a dichotomized 6-month heavy drinking variable (any vs no heavy drinking in the last 90 days) to determine if S/R changes were statistical predictors of heavy drinking.

Multiple logistic regression analysis was then used to test the hypothesis that changes in the S/R variables were statistical predictors of relapse to heavy drinking at 6 months. Heavy drinking days at 6 months was dichotomized into those who had relapsed to heavy drinking (28.5% of the sample; coded as 0) and those who had not (71.5%; coded as 1). Change scores for the five S/R variables that had shown significant change from baseline to 6 months were calculated. Logistic regression was used to test each S/R variable individually, because there was a high degree of collinearity among the S/R variables. In all models, we statistically controlled for heavy drinking days at baseline, gender, and change in AA involvement scores. The latter control variables were chosen because of their theoretical and empirical association with S/R or relapse to heavy drinking. Only the models for the Daily Spiritual Experiences and Purpose in Life scales were statistically significant contributors to the dichotomized 6-month heavy drinking variable.

As seen in Table 4, changes in Daily Spiritual Experiences scores from baseline to 6 months predicted higher

odds of no heavy drinking at 6 months (odds ratio [OR] = 1.04, 95% confidence interval [CI]: 1.01-1.08). For every 1-unit increase in Daily Spiritual Experiences scores from baseline to 6 months, the odds of no heavy drinking increased by about 4%. Recall from Table 2 that the average change in Daily Spiritual Experiences scores from baseline to 6 months was about 3 units. Thus, the average change in Daily Spiritual Experiences scores increased the odds of no heavy drinking during the 6-month follow-up interval by about 12%.

Results for change in the Purpose in Life scale from baseline to 6 months are presented in Table 5. Change in the Purpose in Life score also predicted higher odds of no heavy drinking at 6 months (OR = 1.03, 95% CI: 1.01-1.07). For every 1-unit increase in the Purpose in Life score from baseline to 6 months, the odds of not drinking heavily increased by about 3%. From the analysis presented in Table 2, we know that the average change in Purpose in Life score was about 4 units. Thus, the average change in Purpose in Life score from baseline to 6 months increased the odds of no heavy drinking during the 6-month follow-up interval by about 12%.

The results were not altered by including in these models the number of outpatient chemical-dependency treatment days, the actual duration of the interval between baseline and 6-month data collections, or diagnosis of dependence

TABLE 4. Effects of changes in Daily Spiritual Experiences on absence of heavy drinking at 6 months

Predictor	AOR (95% CI)
Baseline percentage heavy drinking days	0.99 (0.97-1.01)
Gender	
Female	1.93 (0.72-5.19)
Male	—
Change in AA involvement	1.17 (0.88-1.55)
Change in daily spiritual experiences	1.04* (1.01-1.08)

Notes: AOR = adjusted odds ratio; 95% CI = 95% confidence interval for the odds ratio; AA = Alcoholics Anonymous.

* $p < .05$.

TABLE 5. Effects of changes in Purpose in Life on absence of heavy drinking at 6 months

Predictor	AOR (95% CI)
Baseline percentage heavy drinking days	0.99 (0.97-1.01)
Gender	
Female	2.29 (0.84-6.30)
Male	—
Change in AA involvement	1.19 (0.90-1.57)
Change in purpose in life	1.03* (1.01-1.07)

Notes: AOR = adjusted odds ratio; 95% CI = 95% confidence interval for the odds ratio; AA = Alcoholics Anonymous.

* $p < .05$.

versus abuse. We recognize, however, that we do not have a sufficient proportion of individuals with abuse to make statements confidently about S/R changes and 6-month heavy drinking in individuals with alcohol abuse.

Discussion

This study found that half of the quantitatively measured dimensions of S/R changed in the first 6 months after individuals initiated a recovery effort for their alcohol problems. In particular, behavioral and experiential dimensions appeared to be most sensitive to change. S/R practices, daily experiences of spirituality (Daily Spiritual Experiences), forgiveness (the BMMRS Forgiveness measure), use of positive religious coping strategies (Positive Religious Coping), and a sense of purpose or meaning in life (Purpose in Life) all increased significantly from shortly after treatment entry to 6 months later. However, perceptions of the nature of God (Loving God Scale, Controlling God Scale) and beliefs in God and one's stated religiousness (Religious Background and Behaviors belief item) did not change, nor did a scale on applying one's beliefs (the BMMRS Meaning, Values, and Beliefs scale). The use of negative religious coping (Negative Religious Coping) decreased but not to a level that reached significance.

Because spiritual practices and experiences increased significantly over time, whereas spiritual and religious beliefs did not, the results suggest that proactive and experiential dimensions of spirituality, rather than cognitive dimensions of spirituality, were contributing to recovery and less drinking during the first 6 months. This pattern of spiritual change is consistent with two common AA slogans: "Bring your body, your mind will follow" and "Fake it 'till you make it." The data imply that an initial period of openness to spiritual experiences and participation in spiritual activities do not need to be inspired by increases in religiousness or changes in underlying beliefs and values to support sobriety.

As other investigators have found (Carroll, 1993; Noblejas de la Flor, 1997; Waisberg and Porter, 1994), changes in individuals' sense of meaning or purpose in life increased the likelihood of refraining from heavy drinking. However, we also found that changes in day-to-day experiences of God and spirituality were predictive of refraining from heavy drinking. These findings corroborate the longstanding contention of recovering persons and many clinicians that spiritual change is important in recovery from alcoholism. Even in the short span of early recovery, in this case the first 6 months after treatment entry, there is evidence that alcoholics' S/R changes and that these changes are associated with recovery.

If spiritual growth (e.g., increases in meaning and purpose in life and increases in daily spiritual experiences) is associated with recovery, specifically less heavy drinking,

it becomes important to consider possible methods of facilitating such experiences and behaviors in the lives of people seeking treatment for substance problems. Although some may argue that spiritual issues are not valued by all people, it is important to remember that spirituality is not necessarily a matter of theism or belief in a deity, let alone religious attendance. Spiritual growth can be facilitated through several forms of spirituality, including (1) religious spirituality, a structured connection with deity; (2) theistic spirituality, an unstructured connection with deity; and (3) existential spirituality, a nontheistic search for meaning and purpose (Webb, 2003). As such, the facilitation of spiritual growth, and thus its benefits for recovery from addiction, can potentially be tailored to all people regardless of theistic beliefs and identification, as issues of meaning, purpose, transcendence, love, wholeness, and awe are common human phenomena. Accordingly, if 12-step-based treatment or other forms of mutual help are sought, it becomes imperative for the individual to recognize the need and to follow through with the common recommendation to "shop around" for a group and sponsor conducive to nurturing one's particular personal expression of spirituality, whether it is religious, theistic, or existential. Similarly, it is important to encourage the development of more mutual help groups conducive to alternative expressions of spirituality.

Limitations and strengths

The generalizability of these findings is limited by the inclusion of only those participants who were initiating a recovery effort at this treatment site as opposed to other treatment sites or 12-step-only recovery efforts or recovery efforts made without professional or mutual-help-group intervention. As such, these results may be applicable only to similar samples from similar sites where, for example, most individuals have health insurance and many have had some prior exposure to AA. Like many treatment centers in the United States, the program emphasized 12-step facilitation and urged 12-step participation, although it did not require it. Thus, it is not surprising that we found a relationship between S/R change and subsequent alcohol use in a sample that sought treatment in such a program.

It must also be emphasized that although the results are consistent with the notion that spiritual change in specific dimensions contributes to good drinking outcomes during early recovery, the study does not establish the direction of the relationship. Just as spiritual change may contribute to reductions in drinking, reductions in drinking could facilitate spiritual change. Yet another possibility, of course, is that a third factor (e.g., genetic predispositions, or social support in 12-step groups and associated peer influence on S/R) may be responsible for this relationship. Additional longitudinal studies with multiple follow-up points are needed to begin to clarify directionality.

Finally, the choice of S/R measures deserves some comment. Although most of the S/R measures had good psychometric properties, we note that the Forgiveness and perceptions of God scales (Loving God Scale and Controlling God Scale) were characterized by low reliability coefficients, which may have limited our ability to detect change in these constructs, let alone any relationship between changes in these variables and 6-month alcohol-use variables. Given the importance given to forgiveness in the clinical literature and recovery community, a more psychometrically robust measure of forgiveness is a necessity in future studies. Moreover, although it was theoretically important to analyze the different dimensions of spirituality separately, a priori hypotheses regarding specific dimensions were not specified. The choice of heavy drinking as an outcome measure may also be limited, because 12-step facilitation therapy emphasizes abstinence rather than reduced drinking as a treatment goal. In addition, the reader should note that this study does not provide information on which S/R dimensions might be associated with being at risk for alcohol problems.

Despite these limitations, this study is valuable because of the range of S/R dimensions measured, their measurement across time, and the finding that changes in two S/R dimensions were related to the decrease in heavy drinking, even after controlling for AA involvement and gender. To our knowledge, this is the first study to demonstrate differential changes in S/R dimensions in a treatment-seeking sample. Also, this is the first study to investigate a broad array of S/R dimensions and their implications for recovery from alcoholism. Finally, our analyses controlled for baseline levels of heavy drinking, which gives us more confidence in the observed associations between S/R variables and remission from heavy drinking.

Future directions

Several directions for future research are suggested by these findings. These results should be replicated in future studies with a larger sample of patients recruited from multiple sites and with a longer follow-up period. Six months is still early in recovery by most researchers' and clinicians' standards. Furthermore, if the recovery literature is correct, then many changes in recovering alcoholics' S/R are likely to occur over years, rather than months. This speaks to the importance of collecting data on these dimensions across several years and at multiple time points.

Because our results showed differential changes in S/R experiences and behaviors rather than beliefs, it is important to investigate the connection between spiritual behaviors and experiences. Also, the magnitude of the observed changes in S/R dimensions and the clinical relevance of these changes remain to be determined. Although our results indicate that daily spiritual experiences and purpose

in life may be particularly important for early recovery, further work is needed to examine why increases in these two S/R dimensions support fewer episodes of heavy drinking.

Lastly, we recognize the difficulty of studying S/R. Although we used operational definitions consistent with the current psychology of religion literature, we are aware that common and lay understanding of S/R vary. Pending analyses of qualitative data from this survey of respondents' definitions of spirituality, religiousness, and God at both time points will complement and further refine these quantitative findings.

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