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Alcoholics Anonymous and Relapse Prevention as Maintenance Strategies After Conjoint Behavioral Alcohol Treatment for Men: 18-Month Outcomes

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Ninety men with alcohol problems and their female partners were randomly assigned to 1 of 3 outpatient conjoint treatments: alcohol behavioral couples therapy (ABCT), ABCT with relapse prevention techniques (RP/ABCT), or ABCT with interventions encouraging Alcoholics Anonymous (AA) involvement (AA/ABCT). Couples were followed for 18 months after treatment. Across the 3 treatments, drinkers who provided follow-up data maintained abstinence on almost 80% of days during follow-up, with no differences in drinking or marital happiness outcomes between groups. AA/ABCT participants attended AA meetings more often than ABCT or RP/ABCT participants, and their drinking outcomes were more strongly related to concurrent AA attendance. For the entire sample, AA attendance was positively related to abstinence during follow-up in both concurrent and time-lagged analyses. In the RP/ABCT treatment, attendance at posttreatment booster sessions was related to posttreatment abstinence. Across treatment conditions, marital happiness was related positively to abstinence in concurrent but not time-lagged analyses.

Research on the development and testing of potentially effective treatments for alcohol use disorders has yielded several psychosocial treatments with strong evidence for efficacy (Chambliss et al., 1998; McCrady & Nathan, in press). Despite positive findings from randomized clinical trials, aggregate rates of continuous abstinence after treatment are well below 50% (reviewed in McCrady & Nathan, in press), and relapses are more common than abstinence, suggesting the need for continued efforts to develop more effective ways to maintain positive change. The present article reports the long-term results of a study of two methods of maintaining gains after alcohol behavioral couples therapy (ABCT)—relapse prevention and involvement with Alcoholics Anonymous (AA)—and it tests hypothesized mediators of change in prospective, cross-lagged analyses.

ABCT seeks to improve outcomes by enhancing positive aspects of social network functioning. ABCT provides conjoint, manual-guided, cognitive–behavioral outpatient treatment that combines behavioral couples therapy with two effective treatments for alcohol use disorders: coping skills training and behavioral contracting. The goals of ABCT are to (a) help clients achieve and maintain abstinence, (b) teach intimate partners how to cope with drinking situations and support change, and (c) enhance relationship functioning (E. E. Epstein & McCrady, 2002). Past research on ABCT has found evidence of improved treatment retention, improved marital stability, increased marital satisfaction, decreased domestic violence, and improved drinking outcomes (according to some indicators) for couples receiving ABCT versus a comparison treatment (McCrady, Stout, Noel, Abrams, & Nelson, 1991; O'Farrell, Choquette, & Cutter, 1998). However, as with any treatment, relapses still occur after ABCT, and more empirical data on methods of maintaining gains following ABCT are needed.

We conducted a randomized clinical trial for men with alcohol problems and their female partners comparing ABCT with two enhanced ABCT approaches designed to improve maintenance of change after treatment: relapse prevention (RP/ABCT) and AA and/or Al-Anon (AA/ABCT). Relapse prevention (Marlatt & Gordon, 1985) provides a set of cognitive and behavioral skills to prepare clients to manage situations in which they are at high risk for drinking, and it allows for continuing contact with the therapist after the initial course of treatment. AA provides a social network that is supportive of recovery as well as positive close relationships (Humphreys & Noke, 1997). Both treatments provide for continuing access to treatment or recovery activities through booster sessions (RP/ABCT) or AA involvement (AA/ABCT).

Within-treatment and 6-month follow-up results of the clinical trial have been reported previously (McCrady, Epstein, & Hirsch, 1996, 1999). During treatment, there was no differential attrition from treatment between conditions, with mean attendance at ap-

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proximately 11 of 15 possible sessions. The treatment interventions to involve participants in AA were successful in initiating AA attendance—participants in the AA/ABCT condition were more likely to attend AA meetings during treatment than other participants, and they used AA-related skills more frequently (McCrady et al., 1996). In the first 6 months after treatment, across conditions, the men decreased their frequency of drinking and of heavy drinking, with no overall differences among the treatment conditions in the percentage of days they remained abstinent. Two variables favored the behavioral treatments over the treatment condition that involved AA: Participants in the ABCT group showed a longer time before the first heavy drinking day after treatment, and the length of drinking episodes was shorter for participants in the RP/ABCT group (McCrady et al., 1999). The present study reports drinking, marital happiness, and AA-utilization outcomes through 18 months posttreatment.

Two major variables were expected to contribute to positive outcomes. First, ABCT assumes a reciprocal relationship between drinking and the functioning of the intimate relationship, and the model predicts that improved relationship functioning should result in more positive drinking outcomes. Earlier research provides some support for this hypothesis. O'Farrell and his colleagues (O'Farrell, Choquette, Cutter, Brown, & McCourt, 1993; O'Farrell et al., 1998) reported that the use of positive marital behaviors and abstinence were correlated significantly after treatment. Longabaugh, Wirtz, Beattie, Noel, and Stout (1995) reported that social support for abstinence in the first 6 months after treatment predicted abstinence in the subsequent 6 months. And McCrady, Hayaki, Epstein, and Hirsch (2002) reported both that pretreatment marital quality predicted posttreatment abstinence and that immediate posttreatment client marital satisfaction predicted fewer drinks per drinking day at 6-month follow-up. The present study examined the time-lagged relationship between marital happiness and subsequent drinking.

The second major variable expected to influence outcomes was the continuing use of aftercare resources, including AA sessions and booster sessions. Single-group prospective studies (e.g., McKay, Merikle, Mulvaney, Weiss, & Koppenhaver, 2001; Miller, Ninouevo, Klamen, Hoffmann, & Smith, 1997) of AA have reported positive associations between self-help group attendance and outcomes. A multisite study of patients in the Department of Veterans Affairs (VA) addictions treatment system (Humphreys, Huebsch, Finney, & Moos, 1999) demonstrated that individuals treated on units with a 12-step or eclectic orientation had higher rates of participation in self-help groups after treatment than did individuals who received cognitive–behavioral treatment. Prospective analyses of the same sample found that AA involvement in the 1st year after treatment predicted alcohol use outcomes in the 2nd year of follow-up (McKellar, Stewart, & Humphreys, 2003). Longabaugh, Wirtz, Zweben, and Stout (1998) demonstrated superior outcomes for patients receiving 12-step facilitation treatment if they had baseline social networks that were highly supportive of continued drinking. Positive outcomes were mediated specifically by involvement with AA, suggesting that interventions that enhance AA involvement may have beneficial effects on the social networks of individuals with drinking problems. The present study examined the time-lagged relationship between AA attendance and subsequent drinking across six 3-month blocks of time posttreatment.

For the RP/ABCT treatment condition, continuing care was available in the form of posttreatment aftercare sessions. Prospective, single-group evaluation studies (e.g., McKay et al., 2001; Miller et al., 1997; Trent, 1996) have reported positive associations between involvement in aftercare or continuing care and outcomes. In a randomized clinical trial of ABCT, O'Farrell et al. (1998) reported that participants who were assigned to a relapse prevention program that included 15 sessions of aftercare in the year following initial treatment had better drinking outcomes than those who received ABCT alone. The present study examined the relationship between number of booster sessions attended and outcomes.

The first goal of the present study was to describe 18-month drinking, relationship satisfaction, and AA-involvement outcomes and to test the hypothesis that outcomes of the two maintenance-enhanced treatments—AA/ABCT and RP/ABCT—would be superior to outcomes for ABCT. The second goal was to examine the relationship between drinking outcomes and variables hypothesized to influence drinking outcomes (marital happiness and use of maintenance strategies) and to test two specific hypotheses about these relationships: (a) that greater marital happiness would predict less drinking and (b) that greater use of posttreatment maintenance strategies (AA or booster sessions) would be associated with better treatment outcomes.

Method

Participants

Participants were 90 men with alcohol problems and their wives or female partners. To be included, men had to meet the following inclusion criteria: (a) have a current alcohol problem, defined as at least four problem consequences identified from the Michigan Alcoholism Screening Test (MAST; Selzer, 1971) that had occurred in the past 12 months; (b) have consumed alcohol in the past 60 days; (c) be legally married, separated with hopes of reconciliation, or living as married with a partner for more than 6 months; and (d) have a partner who was willing to participate. Couples were excluded if (a) either partner showed signs of current drug dependence; (b) the female partner had a current alcohol problem, defined by at least four problem consequences from the MAST in the past 12 months; (c) either partner had psychotic symptoms; or (d) either partner showed signs of organic brain syndrome. All of the men met *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., rev.[the diagnostic system in use at the initiation of the study]; American Psychiatric Association, 1987) criteria for alcohol dependence (95%) or alcohol abuse on the basis of their responses to the Composite International Diagnostic Interview–Substance Abuse Module (CIDI-SAM; Robins et al., 1988).

A total of 115 potential participants were interviewed in person to determine eligibility; 10 were excluded or refused to consent. Fifteen couples dropped out between the time that they signed consent forms and the first treatment session, leaving 90 couples who attended at least one treatment session and made up the target sample for all outcome reports. The mean age of male participants was 39.4 years ($SD = 10.3$); they had a mean of 13.4 years of education ($SD = 2.3$), 92.3% were Caucasian, and 86.7% were legally married. Female participants' mean age was 37.4 years ($SD = 10.3$); they had a mean of 13.7 years of education ($SD = 2.0$), and 93.3% were Caucasian. The men reported drinking on 59.7% of the days ($SD = 30.2$) in the 6 months prior to treatment. Additional details about participant characteristics and screening procedures are reported in McCrady et al. (1999).

Procedure

Couples were recruited through newspaper advertising and from local outpatient treatment programs. Two hundred and twenty individuals inquired about the study by telephone; if they were interested and met study criteria, couples were scheduled for an in-person intake interview with a master's- or doctoral-level clinician. Most callers who did not schedule an in-person interview were not screened out of the study but, rather, were not interested in participating after learning more about the project. During the in-person interview, further screening was completed, study procedures were described, and informed consent was obtained. Couples completed a packet of self-report measures at home and returned for a baseline research interview with a trained interviewer. At the completion of the interview, they were randomly assigned to one of three treatment conditions: ABCT ($n = 30$), RP/ABCT ($n = 31$), or AA/ABCT ($n = 29$). All treatment sessions were provided with both members of the couple present. Therapists were advanced graduate students in clinical psychology or doctoral-level psychologists, and they were fully crossed with treatment conditions. Therapy was manual guided and included 15 outpatient sessions. No time constraints were placed on the number of weeks required to deliver the treatment. Length of treatment was unrelated to treatment outcomes, so it was not controlled for in the analyses. Participants who completed at least five sessions of RP/ABCT treatment were scheduled for booster sessions during the 1st year after treatment at 1, 3, 6, and 12 months. Therapists had the option of scheduling up to two additional sessions after each scheduled booster session. A detailed description of treatment procedures and measures to assure treatment fidelity can be found in McCrady et al. (1999).

Interviewers attempted to contact couples each month by telephone for 18 months after the completion of treatment. No incentives were offered for completion of follow-up interviews, a design feature that may have had a negative impact on follow-up rates. Data were aggregated into 3-month blocks, and data from 2 of the 3 months in each time block had to be available for the time block to be included in the analyses. In-person interviews were scheduled immediately after treatment and every 6 months thereafter throughout the 18-month follow-up period.

Measures and Variables

Measures for the present study were drawn from a larger battery of measures. These are detailed below.

The Timeline Followback Interview (TLFB; Sobell et al., 1980). The TLFB, which was collected at baseline and at each monthly follow-up interview, is a semi-structured interview that uses a calendar format and memory prompts to aid recall about the amount of alcohol consumed on each day during the window of observation. Retrospective TLFB data for the 6 months prior to treatment were collected with both partners present at the interview. Interviewers helped couples to resolve discrepancies in recall and entered agreed upon drinking data for each day. The primary outcome variable derived from the TLFB was percentage of days abstinent (PDA).

Monthly posttreatment telephone follow-up interviews (Polich, Armor, & Braiker, 1980). These were conducted by trained interviewers, separately with male participants and their female partners. The TLFB interview was used to collect daily drinking data, and information about AA attendance was collected as well. Preliminary analyses (see McCrady et al., 1999) suggested that, for a small number of cases, there were substantial discrepancies between male and female reports about the male participant's drinking. For each follow-up time block, male and female reports were compared, and the report reflecting the poorer outcome was used for the analyses. The primary variable used for AA attendance was the percentage of days during the follow-up period that the participant attended AA.

Drinking severity. A principal-components analysis was used to derive a measure of baseline drinking severity. Four variables were entered: the Alcohol Dependence Scale (Skinner & Allen, 1982), the MAST (Selzer, 1971), the total number of problems from the alcohol portion of the CIDI-SAM (Robins et al., 1988), and baseline mean drinks per drinking day from the TLFB. Results suggested a one-factor solution, and all variables loaded at .60 or above, with three of the four loading above .80. The baseline drinking severity factor and baseline frequency of drinking were unrelated, $r(68) = -.01$, *ns*, and were treated as separate covariates in the analyses.

Marital quality. A principal-components analysis was used to derive a measure of baseline marital quality. Client and spouse relationship satisfaction scores from the Dyadic Adjustment Scale (DAS; Spanier, 1976) and the Total Problems score from the Areas of Change Questionnaire (Margolin, Talovic, & Weinstein, 1983) loaded on one factor, with all factor loadings above .80 (Total Problems loaded negatively on the factor).

Marital happiness. Posttreatment relationship satisfaction was assessed at each follow-up interview using the Marital Happiness Scale (MHS), a 7-point Likert-type scale rating of overall satisfaction with the relationship from 1 (*very unhappy*) to 7 (*greatest happiness ever*). Although a single item to measure marital happiness is not ideal, Goodwin (1992) reported correlations between the single marital happiness item from the DAS (Item 31; Spanier, 1976) and the DAS without Item 31 of .73 and .67, respectively, in two separate studies, suggesting that the single item provides an adequate measure of relationship happiness.

Data Analysis Plan

Treatment conditions were compared on aggregated outcomes across the 18 months of follow-up using analyses of variance (ANOVAs). For all other analyses, we used hierarchical linear modeling (HLM; Bryk & Raudenbush, 1987) to test between-groups differences in individual growth curves in PDA over the 18-month follow-up, which we divided into six 3-month time periods for purposes of description and analysis. Although less familiar than classical methods of data analysis, techniques like HLM offer distinct advantages in the analysis of substance use outcomes, including greater flexibility for handling missing data and for analyzing dependent variables that are not normally distributed (Carbonari, Wirtz, Muenz, & Stout, 1994). In all HLM analyses, we modeled individual intercepts and linear and quadratic time slopes as random effects (i.e., Level 1 correlates) and treatment group and other covariates as fixed effects (i.e., Level 2 correlates). Model fit indexes (Schwarz's Bayesian criterion and Aikaike's information criterion) indicated that including the quadratic effect of time as a Level 1 correlate generally improved model fit; however, given that the quadratic effect of time was never significant as a fixed effect, we included only the linear effect of time (as well as Time $\times$ Treatment Condition interactions) in Level 2 analyses. Because follow-up drinking data for the majority of the follow-up periods (four of six follow-up quarters) were available from only 73.3% of participants, we conducted two sets of analyses. In the first set, we followed a rule similar to that used by Project MATCH (Project MATCH Research Group, 1997) and included participants who provided data for at least four of the six follow-up time periods ($n = 66$). In a subsequent, worst-case analysis, we included all participants who entered treatment ($n = 90$). In these worst-case analyses, for those with missing data for any given follow-up time period, we substituted that participant's baseline PDA as an estimate of poor outcomes that might be associated with being lost to follow-up. This represents a lower bounds estimate of PDA.

Following these analyses, we used HLM to model marital happiness over the six 3-month time periods to test the hypothesis that individuals in the maintenance-enhanced conditions would report greater marital happiness than those receiving ABCT alone. We then used HLM to model percentage of days of AA attendance over the six 3-month time periods to test the hypothesis that individuals in the AA/ABCT condition would be more likely to attend AA during follow-up than those in the other treatment conditions.

To examine relationships between outcomes and factors hypothesized to impact outcome, we first examined the association between marital hap-

piness during follow-up and concurrent alcohol use outcomes using HLM to predict PDA and including marital happiness as a covariate that varied over follow-up periods. Next, we reran the analyses using a lagged model in which we predicted PDA in follow-up Periods 2–6, with PDA and marital happiness in the prior period as time-varying covariates. We then examined the association between AA attendance during follow-up and concurrent alcohol use outcomes using percentage of days attending AA as a time-varying covariate. We also tested whether AA attendance was more strongly associated with outcome in the AA/ABCT condition relative to the other conditions using interaction terms. We then reran these analyses using a lagged model in which we predicted PDA in Periods 2–6 with PDA and percentage of AA attendance in the prior period as time-varying covariates. Finally, we examined the association between booster session attendance during follow-up and drinking outcomes by entering the number of booster sessions into an HLM analysis predicting PDA, covarying the baseline drinking severity factor and baseline PDA.

Results

Follow-Up Sample

In total, 66 out of 90 (73.3%) participants met criteria for inclusion in the main outcome analyses by providing data for at least four of the six 3-month follow-up time periods, including 67.0% of those in ABCT, 77.4% of those in AA/ABCT, and 75.9% of those in RP/ABCT. Inclusion rates did not differ significantly by treatment condition, $\chi^2(2, N = 90) = 1.04$, $p = .59$. Those included did not differ significantly from those not included on age, education, baseline PDA, or baseline severity of alcohol problems. However, their baseline marital functioning, assessed using the marital factor score, was significantly better, $t(84) = 2.02$, $p = .046$.

Comparative Treatment Outcomes

Alcohol use outcomes. Mean PDAs for the follow-up sample, averaged over the entire 18-month follow-up, were 80.4 ($SD = 25.6$) for those in ABCT; 76.0 ($SD = 30.4$) for those in AA/ABCT; and 81.2 ($SD = 28.5$) for those in RP/ABCT. ANOVAs indicated that treatment conditions did not differ significantly on this variable, $F(2, 63) = 0.24$, $p = .78$, which was arcsine transformed prior to analysis to correct negative skewness. Using a worst-case assumption for missing data, in which we substituted an individual's baseline PDA as an estimate of outcome for a given missing time period, mean PDAs for the entire sample, averaged over the entire 18-month follow-up, were 68.6 ($SD = 31.1$) for those in ABCT; 68.1 ($SD = 33.8$) for those in AA/ABCT; and 75.0 ($SD = 32.3$) for those in RP/ABCT. ANOVAs again indicated that treatment conditions did not differ significantly on this variable, which was also arcsine transformed, $F(2, 86) = 0.67$, $p = .51$.

PDA by follow-up period and treatment condition is summarized in Table 1. To test group differences in PDA using HLM, we dummy coded treatment condition with ABCT as the reference group to determine whether either AA/ABCT or RP/ABCT resulted in greater PDA during follow-up. Because the use of covariates unrelated to treatment condition but potentially related to the dependent variables improves statistical power for detecting main effects of treatment by reducing nuisance variance, we covaried baseline PDA and the baseline drinking severity factor in these analyses. We also included as a covariate a term carrying the linear effect of time (no quadratic effects were evident). Results of the HLM analyses indicated that the main effect of treatment condition on PDA was nonsignificant ($p = .94$), as were the unique effects of both dummy codes (ps $> .70$). Greater PDA at baseline was associated with greater PDA at follow-up ($B = 0.004$, $SE = 0.002$, $p = .04$), but the effect of drinking severity was nonsignificant ($p = .10$). The main effect of time was nonsignificant ($p = .48$), indicating that PDA, on average, was relatively stable over follow-up. The Time × Treatment Condition interaction was also nonsignificant ($p = .36$), indicating no differences between groups in maintenance of alcohol use outcomes over time. Results of the worst-case analyses including all subjects receiving at least one session of treatment yielded equivalent results regarding treatment effects. However, the linear effect of time was significantly negative in these analyses ($B = -.03$, $SE = 0.01$, $p = .01$), indicating significant reductions in PDA over time when worst-case assumptions were applied. Treatment condition did not interact significantly with time in these analyses.

Marital happiness. Mean marital happiness scores, averaged over the entire 18-month follow-up period, were 5.17 ($SD = 0.96$) for those in ABCT; 4.97 ($SD = 1.02$) for those in AA/ABCT; and 5.05 ($SD = 1.08$) for those in RP/ABCT. ANOVAs indicated that treatment conditions did not differ significantly on this variable, $F(2, 60) = 0.19$, $p = .83$.

To test group differences in marital happiness (on the MHS) using HLM, we dummy-coded treatment condition with ABCT as the reference group to determine whether either AA/ABCT or

Table 1
Percentage of Days Abstinent for Participants in Each Treatment Condition in Each 3-Month Block of the Follow-Up Period

	ABCT			AA/ABCT			RP/ABCT		
Block	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*
1	89.89	23.32	20	76.79	32.99	24	82.71	24.88	22
2	79.51	29.60	20	70.41	37.32	24	80.63	30.28	22
3	82.41	27.32	20	75.91	35.04	24	84.00	29.56	22
4	82.72	30.72	20	78.74	33.39	24	83.13	29.39	22
5	74.15	31.08	18	79.23	31.24	23	76.78	36.95	22
6	70.35	40.40	17	77.16	35.27	20	81.03	31.81	21

Note. ABCT = alcohol behavioral couples therapy; AA/ABCT = ABCT with interventions to encourage Alcoholics Anonymous involvement; RP/ABCT = ABCT with relapse prevention techniques.

RP/ABCT resulted in greater MHS scores during follow-up. In these analyses, we covaried the baseline marital happiness factor, PDA, and the baseline drinking severity factor, and we also included a term carrying the linear effect of time. Results of the HLM analyses indicated that the main effect of treatment condition was nonsignificant ($p = .11$), as were the unique effects of both dummy-codes ($ps > .25$). Greater marital happiness at baseline was associated with greater happiness at follow-up, ($B = 0.61$, $SE = 0.11$, $p = .0001$). Greater PDA at baseline was associated with less marital happiness at follow-up ($B = -0.0080$, $SE = 0.0036$, $p = .03$), whereas drinking severity at baseline was not significantly related to marital happiness ($p = .89$). The main effect of time and the Time × Treatment Condition interaction were nonsignificant ($ps > .80$).

AA attendance. During the 18-month follow-up period, 78.2% of those in AA/ABCT attended at least one AA meeting, compared with 40.0% in ABCT and 45.5% in RP/ABCT. Logistic regression analyses indicated that attendance of at least one AA meeting was significantly more likely in AA/ABCT than in ABCT (odds ratio = 5.5, $p = .008$) or RP/ABCT (odds ratio = 3.7, $p = .03$). Mean percentages of days attending AA, averaged over the entire 18-month follow-up period, were 10.5 ($SD = 15.5$) for those in ABCT; 18.5 ($SD = 21.8$) for those in AA/ABCT; and 6.8 ($SD = 14.2$) for those in RP/ABCT. An ANOVA indicated that treatment conditions did not differ significantly on this variable, $F(2, 62) = 2.71$, $p = .08$, which was square-root transformed prior to analysis to correct positive skewness.

Percentage of days attending AA during follow-up is graphed by follow-up period and treatment condition in Figure 1. To test whether AA attendance differed over time in the AA/ABCT condition relative to the other conditions, we dummy coded treatment condition with AA/ABCT as the reference group. Percentage of days attending AA prior to treatment, the baseline drinking severity factor, and baseline PDA were included as covariates, along with a term carrying the linear effect of time. Results indicated that AA attendance over time was significantly greater in the AA/ABCT condition compared with both the ABCT condition ($B = 1.91$, $SE = 0.60$, $p = .0002$) and the RP/ABCT condition ($B = 1.94$, $SE = 0.59$, $p = .001$). The baseline drinking severity factor was also associated positively with greater AA attendance ($B = 1.40$, $SE = 0.29$, $p = .0001$). Baseline percentage of AA days did not significantly predict AA attendance at follow-up ($B = 0.28$, $SE = 0.16$, $p = .08$). The main effect of time and the Time × Treatment Condition interaction were nonsignificant ($ps > .30$).

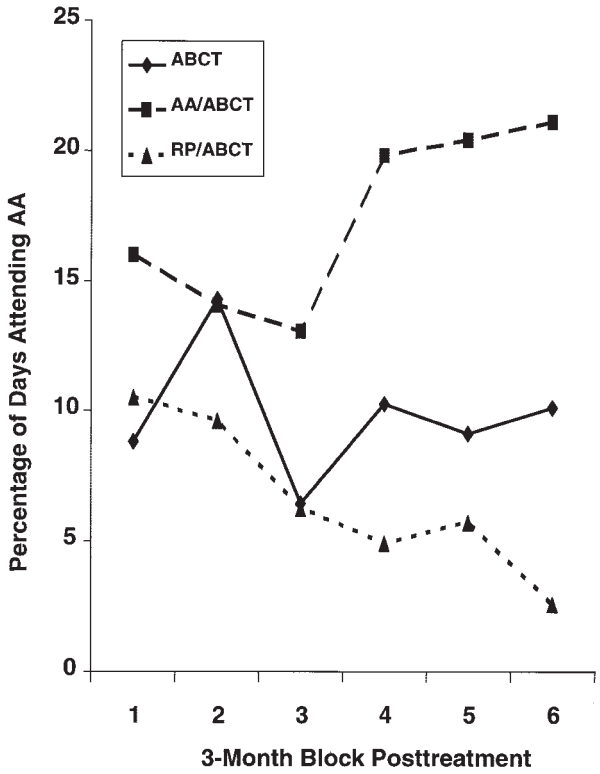

Figure 1. Percentage of days that participants attended Alcoholics Anonymous (AA) for each treatment condition in each 3-month block of the follow-up period. ABCT = alcohol behavioral couples therapy; AA/ABCT = ABCT with interventions to encourage Alcoholics Anonymous involvement; RP/ABCT = ABCT with relapse prevention techniques.

Testing Variables Influencing Alcohol Use Outcomes

Marital happiness and alcohol use. To examine the association between marital happiness and PDA over time, we conducted an HLM analysis predicting PDA in which marital happiness was included as a covariate that varied over follow-up periods. The drinking severity factor, baseline PDA, and treatment condition were included as covariates. In this model, marital happiness in a given follow-up period was associated with significantly greater PDA in that period ($B = 0.13$, $SE = 0.02$, $p = .0001$). We then added Treatment Condition × Marital Happiness interactions to the model to determine whether marital happiness was differentially associated with outcome by condition. These Marital Happiness × Treatment Condition interactions were nonsignificant ($ps \geq .70$). Finally, we reran these analyses using the lagged model in which we predicted PDA in Periods 2–6 with PDA and marital happiness in the prior period as time-varying covariates. Marital happiness in each of Periods 1–5 no longer significantly predicted PDA in the subsequent follow-up period when the effect of PDA in each of Periods 1–5 was covaried ($p = .25$). Greater PDA in the preceding month (i.e., as a lagged, time-varying covariate) was strongly associated with greater PDA in the subsequent month ($B = 0.92$, $SE = 0.03$, $p = .0001$). The Marital Happiness × Treatment Condition was also nonsignificant ($p = .82$).

AA attendance and alcohol use. To examine the association between AA attendance and PDA over time, we conducted an HLM analysis predicting PDA in which AA attendance (percentage of days attending AA) was included as a covariate that varied over follow-up periods. The baseline drinking severity factor, baseline PDA, and treatment condition were included as covariates. In this model, AA attendance was associated with significantly greater PDA ($B = 0.04$, $SE = 0.01$, $p = .0006$). We then added Treatment Condition × AA Attendance interactions to the model. Results indicated that AA attendance was significantly less positively associated with PDA in the RP/ABCT condition relative to the AA/ABCT condition ($B = -0.07$, $SE = 0.03$, $p = .007$). AA attendance also was less positively associated with PDA in the ABCT condition relative to the AA/ABCT condition ($B = -0.03$,

SE = .02, *p* = .13), but this effect was nonsignificant. We reran these analyses using the lagged model in which we predicted PDA in Periods 2–6 with PDA and Percentage of AA attendance in the prior period as time-varying covariates. AA attendance in each of Periods 1–5 significantly predicted PDA in the subsequent follow-up period, above and beyond the effect of PDA in each of Periods 1–5 (*B* = 0.02, *SE* = 0.01, *p* = .002). Greater PDA in each of Periods 1–5 was associated strongly with greater PDA in the subsequent period (*B* = 0.88, *SE* = 0.03, *p* = .0001). However, the AA Attendance × Treatment Condition interaction was nonsignificant (*p* = .69), suggesting that AA attendance did not differentially predict PDA by treatment condition when considered in a lagged model.

Booster session attendance and alcohol use. Couples in the RP/ABCT condition attended an average of 2.4 (*SD* = 1.8, range = 0–5) booster sessions. Five participants did not utilize any booster sessions. We entered number of booster sessions into an HLM analysis predicting PDA covarying for the baseline drinking severity factor and baseline PDA. This analysis included only those in RP/ABCT. Results indicated that greater booster session attendance was associated with greater PDA (*B* = 0.14, *SE* = 0.06, *p* = .03). As in previous analyses, greater PDA at baseline was associated with greater PDA at follow-up (*B* = 0.0078, *SE* = 0.0038, *p* = .045), but the effect of drinking severity was nonsignificant (*p* = .11).

Discussion

Outcomes and Comparisons of Treatment Conditions

Drinkers who provided follow-up data were abstinent from alcohol almost 80% of the days during follow-up (compared with less than 40% of the days prior to treatment), and they maintained positive outcomes throughout the 18 months, with evidence of deterioration over time only when worst-case assumptions were made about participants lost to follow-up. The days-abstinent outcomes for participants who provided outcome data were very similar to those of other outpatient treatment outcome studies of cognitive–behavioral therapies (e.g., Project MATCH Research Group, 1997). Relationship satisfaction remained high during follow-up, averaging 5 on a Likert-type scale ranging from 1 (*very unhappy*) to 7 (*greatest happiness ever*), and there were no condition effects for marital happiness.

There were no differences among the treatment conditions on drinking outcomes, contrary to the expectation that the two maintenance-enhanced treatments would yield better outcomes. Although the sample size was small, it is unlikely that small sample size accounted for the nonsignificant results. The main effects of treatment condition accounted for only 0.7% of the variance in PDA averaged over the entire 18-month follow-up (1.5% of the variance when worst-case assumptions were made), a very small effect size.

The AA/ABCT treatment condition, which focused on AA attendance, was more successful in getting people to attend AA than the other two treatments, a finding consonant with those reported from Project MATCH (Longabaugh et al., 1998) and the VA collaborative study (Humphreys et al., 1999). The treatment effect was sustained through 18 months of follow-up, with no evidence of decay in attendance over time. Increased AA attendance after AA/ABCT treatment was not simply an effect of having gone to AA before treatment, because baseline AA attendance was not a significant predictor of AA attendance during follow-up. Further evidence that AA/ABCT treatment differentially affected AA-related attendance was that the concurrent positive relationship between AA attendance and PDA was stronger for those in the AA/ABCT condition than for those in either of the other two treatments. This finding suggests that success for participants in the AA/ABCT treatment was more strongly tied to attending AA than it was for participants in the other conditions. However, in the lagged analyses, this treatment condition effect was no longer significant, and therefore we do not have more direct evidence of a causal link.

Factors Influencing Treatment Outcome

The expected positive relationship between drinking and relationship functioning was found, in that marital happiness and abstinence were positively correlated throughout the follow-up period. However, when we conducted a time-lagged analysis, the effect of marital happiness in a given period did not predict PDA in the following time period beyond the effect of PDA in that same period. Although these results suggest that marital happiness and drinking follow correlated trajectories, we did not find evidence suggesting that marital happiness resulted in better future drinking outcomes. The present study is the first to examine marital happiness and drinking outcomes in a cross-lagged analysis over multiple, successive follow-up periods, and it raises questions about the strength of the influence of the intimate relationship on subsequent drinking.

The relationship between drinking and marital happiness was not straightforward. In addition to finding that marital happiness did not predict abstinence, we also found that greater abstinence prior to treatment predicted less marital happiness during follow-up. Although there is not an easy way to explain this finding, it is possible that individuals with greater abstinence prior to treatment were similar to the episodic, out-of-home drinkers described by Jacob, Dunn, and Leonard (1983), who found that less frequent drinking, but greater domestic violence and marital distress, characterized the out-of-home drinking pattern. Our prior analyses of baseline data may support this hypothesis, in that we found that greater frequency of the male partner's drinking at baseline was associated with less distress among the spouses (Kahler, McCrady, & Epstein, 2003).

Results provided strong support for the anticipated relationship between AA utilization and drinking outcomes. A recent prospective analysis of AA utilization and drinking outcomes (McKellar et al., 2003) demonstrated clearly that AA utilization in the 1st year after treatment predicted better drinking outcomes in the 2nd year and that drinking outcomes did not predict subsequent AA involvement. Additional analyses found that motivation and other psychopathology did not explain the relationship between AA attendance and positive outcomes. The present results lend additional support to the view that AA attendance per se contributes to positive outcomes. Even when baseline drinking severity and PDA during a 3-month block of time were controlled for, AA attendance during each time block predicted PDA in the subsequent 3 months.

Similar to the AA/ABCT treatment, greater use of the posttreatment support provided by the RP/ABCT booster sessions was

associated with better drinking outcomes. There are several plausible explanations for this observed association that cannot be tested with the existing data. First, both more booster session attendance and less drinking may be explained by a common third factor like greater motivation to change. Alternatively, clients may have used booster sessions as a way to forestall relapses by scheduling sessions when they were having difficulty. A third possibility is that clients scheduled sessions after initial relapses as a way to shorten the length or severity of the relapse. A fourth possibility is that the standard scheduling of the booster sessions, with two booster sessions scheduled during the first 3 months after treatment (the period of highest risk for relapse; Marlatt & Gordon, 1985), was responsive to the difficulties clients encountered in the early months after treatment and helped them to deal with these effectively. Our finding of a positive association between additional relapse prevention sessions and positive drinking outcomes is similar to O'Farrell et al.'s (1998) findings. However, those authors also reported a main effect of treatment condition in that ABCT enhanced with relapse prevention was more effective than ABCT without relapse prevention. O'Farrell et al.'s (1998) relapse prevention treatment was more intensive than ours, including 15 booster sessions over the year following initial treatment, and it was delivered in a group format. Either the greater intensity of the treatment or the group format may have been influential in yielding differentially positive outcomes.

A particularly intriguing finding was the lack of a clear causal pathway from intervention to AA attendance to a more positive treatment outcome. Even though the AA/ABCT treatment was more effective in getting clients to attend AA, the enhanced AA attendance did not translate into better overall treatment outcomes. Earlier research (Morgenstern, Labouvie, McCrady, Kahler, & Frey, 1997) found that enhanced AA attendance seemed to improve treatment outcomes by influencing common change processes, such as commitment to abstinence, self-efficacy, and coping skills. Given that all of the treatments in the present study targeted these variables and enhanced social support through the primary intimate relationship, it may be that individuals were using the same common processes to maintain abstinence but that they acquired and were maintaining the use of these processes through different mechanisms. Earlier articles examining AA and behavioral therapy at the level of intervention (e.g., McCrady, 1994) have identified substantial overlap in specific interventions associated with AA and behavior therapy, and a more recent review of empirically supported treatments for alcohol use disorders (McCrady & Nathan, in press) identified several major common elements in effective treatments. Both studies provide additional support for the possibility of common processes of change acquired through alternative routes. It also is possible that participants in the AA/ABCT condition had a stronger belief than those in the other two treatment conditions that AA would help them to remain abstinent, and attendance at AA and maintenance of abstinence both reflected a similar underlying cause like greater motivation to change.

Study Limitations

All participants volunteered to participate and could therefore, as a group, be expected to have a more positive prognosis than a typical treatment sample. However, in an earlier report on men from the present study, Steinberg, Epstein, McCrady, and Hirsch (1997) found that 53% of participants reported external sources of motivation for entering treatment, suggesting that the drinkers entered the study for reasons not dissimilar to those of participants in other treatment-seeking samples. Similarity of baseline characteristics and outcomes to those of other outpatient treatment samples also suggests that the method of recruitment did not result in a sample with an unusually positive prognosis.

Interpretation of the results is limited somewhat by the 73.3% follow-up rate. Although the rate is comparable to those in many treatment outcome studies (e.g., Tomasson & Vaglum, 1996), several recent studies have reported higher follow-up rates (e.g., Project MATCH Research Group, 1997). In particular, it may be that couples who were happier and more stable, who also would have a better prognosis, were those who remained through follow-up. Worst-case analyses comparing outcomes across groups yielded the same pattern of results as analyses including participants with more complete data, but other, subtler differences could not be detected due to the missing data.

A third possible limitation is the unknown impact on outcome of frequent telephone contacts during follow-up (Clifford & Maisto, 2000). Although it is possible that participants found the calls supportive and/or therapeutic, the frequency of the calls also may have been aversive and, perhaps, countertherapeutic. Although there is no way to determine the actual impact of the follow-up calls on outcome, it is as possible that the impact was negative as it is that it was positive.

A fourth limitation is the lack of data about specific treatment processes. We measured AA involvement through attendance only rather than using richer measures of involvement that have been demonstrated to have a stronger relationship to treatment outcome (Tonigan, Connors, & Miller, 1996). Additionally, the study was lacking in measures of processes hypothesized to underlie cognitive–behavioral treatment, such as cognitive and behavioral coping skills (e.g., Ouimette, Finney, Gima, & Moos, 1999), and it was also lacking in measures of the processes underlying couples therapy, such as communication, problem solving, and relational attributions (e.g., N. B. Epstein & Baucom, 2002). Relatedly, a single-item measure of marital happiness was used. However, earlier studies (e.g., Goodwin, 1992) have reported a robust correlation between a single-question marital happiness item and the full DAS, suggesting that the single item was a reasonable proxy measure of relationship satisfaction.

Conclusions and Future Directions

As with other treatment outcome studies, the present study demonstrates that individuals who seek treatment for alcohol use disorders are much better able to sustain abstinence after treatment than they were prior to treatment, and the lack of between-groups differences is a common finding. The absence of a no-treatment control group does not allow us to assume that treatment caused these changes, but the changes observed are consistent and mark a notable improvement over functioning prior to help seeking. There was no evidence that specific interventions tested in the present study were differentially effective in yielding positive outcomes. Few studies have systematically studied the effects of targeting AA involvement as a treatment intervention, and our results are similar to others (e.g., Humphreys et al., 1999; Longabaugh et al.,

1998) in demonstrating that AA involvement can be enhanced as a direct result of treatment interventions. Particularly intriguing in our results was the finding of a strong, prospective relationship between AA attendance and abstinence, as well as a strong relationship between use of booster sessions and abstinence. The finding that two different types of continuing care both contributed to successful outcomes suggests the importance of continuing to focus on a variety of strategies to engage clients in continuing care. However, the lack of a clear pathway from intervention to maintenance strategy to outcome suggests the importance of considering a common-factors approach to understanding successful change. Future research should routinely assess putative common factors in positive treatment outcomes, including, at a minimum, commitment to abstinence or some other aspect of motivation, coping skills, self-efficacy, and social network support. If, as the current literature suggests, these elements are common to effective treatments, then future treatment development research should target these elements regardless of the theoretical model underpinning the treatment.

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