Self-Efficacy, Therapeutic Alliance, and Alcohol-Use Disorder Treatment Outcomes*

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ABSTRACT: Objective. High abstinence self-efficacy reliably predicts better treatment outcomes for patients with alcohol use disorders, but little is known about aspects of treatment that may be particularly beneficial for patients who enter treatment with low self-efficacy. This study examines whether the relationship between self-efficacy and treatment outcomes is influenced by the quality of the therapeutic alliance in Project MATCH (Matching Alcoholism Treatments to Client Heterogeneity), a multisite clinical trial of three treatments for alcohol use disorders. **Method:** Information on 785 patients in the outpatient sample of Project MATCH was used to test for an interaction between baseline self-efficacy and therapeutic alliance in relation to 1-year alcohol use outcomes. **Results:** A significant interaction was found between self-efficacy and the therapists' perception of the therapeutic alliance predicting 1-year drinking outcomes. Patients with low self-efficacy who established a strong treatment alliance, as judged by the therapist, experienced 1-year outcomes that were superior to those of patients with low self-efficacy with poorer treatment alliance and comparable with those of patients with high self-efficacy. Therapeutic alliance was not strongly related to the outcomes of patients with high baseline self-efficacy. **Conclusions:** In patients who are treated for alcohol-use disorders, a positive therapeutic alliance may counteract the negative impact of a low baseline self-efficacy. Potential reasons why the therapist's perception of the alliance may be particularly important for patients with low self-efficacy are discussed. (*J. Stud. Alcohol* **67:** 465-472, 2006)

FOR INDIVIDUALS WITH alcohol-use disorders (AUDs), abstinence self-efficacy, or an individual's confidence in the ability to remain abstinent (Bandura, 1982), is hypothesized to be an important deterrent to relapse in high-risk situations (Marlatt and Gordon, 1985; Witkiewitz and Marlatt, 2004). High abstinence self-efficacy at discharge and, to a lesser extent, at treatment entry generally predict better substance-related outcomes in patients with both alcohol and drug use disorders (DiClemente et al., 2001; Ilgen et al., 2005; Miller and Longabaugh, 2003; Rychtarik et al., 1992; Stephens et al., 1993). Viewed differently, individuals with low self-efficacy are at an elevated risk for poor treatment outcomes. Thus, identifying aspects of treatment that may be particularly beneficial for patients with low self-efficacy is especially important if interventions are to be tailored to fit the needs of these high-risk individuals.

The potential for a specific *type* of treatment to be especially well suited for patients with low abstinence self-efficacy was examined in Project MATCH (Matching Alcoholism Treatments to Client Heterogeneity), a multisite clinical trial of three different treatments for AUDs (Twelve-Step Facilitation [TSF; Nowinski et al., 1992]; Cognitive Behavioral Treatment [CBT; Kadden et al., 1992]; or Motivational Enhancement Therapy [MET; Miller et al., 1992]). Little support was found for differential posttreatment benefits of specific types of treatment in patients with either low or high self-efficacy in Project MATCH (DiClemente et al., 2001; Project MATCH Research Group, 1997). However, consistent with some past research, baseline self-efficacy reliably predicted reduced quantity and frequency of alcohol use following treatment for outpatients, regardless of the type of treatment received (DiClemente et al., 2001).

As noted by Project MATCH researchers, the failure to find consistent evidence of patient-treatment matching may be due to, in part, the shared characteristics (or common factors) among the three treatment conditions (Cooney et al., 2003). However, variability in these common factors *within* treatment conditions may be important in accounting for treatment outcomes of patients with low self-efficacy. One such factor is therapeutic alliance, which reflects the quality of the relationship between therapist and patient; it has strongly predicted substance-related treatment outcomes (Lebow et al., 2006; Meier et al., 2005). In fact,

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the quality of the therapeutic alliance typically accounts for more variance in treatment outcomes than do the specific techniques that therapists employ (Lambert and Barley, 2001).

Within Project MATCH, therapeutic alliance significantly predicted outpatients' posttreatment outcomes with no significant interaction by treatment type (Connors et al., 2000). In addition to the overall positive association between therapeutic alliance and treatment outcomes, a positive alliance may be particularly important for patients who enter treatment lacking confidence in their ability to remain abstinent. Specifically, because of the increased susceptibility of patients with low self-efficacy to external influences (Bandura, 1997; DiClemente et al., 1995; Marlatt and Gordon, 1985), the impact of the therapeutic relationship may well be greater in patients with little confidence in their ability to remain abstinent. To the best of our knowledge, no study has explicitly examined the potential for self-efficacy to interact with therapeutic alliance in accounting for AUD treatment outcomes.

The present study examines whether self-efficacy interacts with therapeutic alliance in relation to 1-year alcohol use-disorder outcomes. It is expected that a positive therapeutic alliance will be particularly helpful for patients with low self-efficacy. If this interaction effect is found, it may help treatment providers identify specific aspects of treatment that are especially beneficial for an at-risk subgroup of AUD patients.

Method

Project MATCH researchers investigated the relationship between patient and treatment characteristics in predicting outcomes following alcohol treatment. Patients were randomly assigned to one of three treatments: TSF (Nowinski et al., 1992), CBT (Kadden et al., 1992), or MET (Miller et al., 1992). Project MATCH was composed of two independent samples referred to as the "outpatient" and "aftercare" samples. Patients in the outpatient sample had not recently completed any inpatient treatment. The aftercare sample comprised patients who had received 7 days or more of inpatient or intensive day treatment immediately prior to assignment to outpatient treatment in Project MATCH. The present study focuses only on Project MATCH outpatients for the following reasons: (1) our expressed interest was in the role of self-efficacy at the beginning of treatment, and (2) previous analyses in Project MATCH found the strongest effects for self-efficacy and therapeutic alliance within the outpatient sample (Connors et al., 2000; DiClemente et al., 2001; Project MATCH Research Group, 1997). Thus, we investigated whether the previously reported association between low self-efficacy and poor treatment outcomes in outpatients in project MATCH (DiClemente et al., 2001) would be weaker in patients with a stronger therapeutic alliance. Patients were assessed at baseline, during treatment, at 3 months (end of treatment), and at 6, 9, 12, and 15 months after treatment initiation.

Participants

To be eligible for Project MATCH, patients were required to be over 18 years of age and fulfill the following conditions: (1) meet Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (American Psychiatric Association, 1994), criteria for alcohol abuse or dependence; (2) report alcohol as the primary substance of use; (3) report alcohol use within 3 months of treatment entry; (4) not meet criteria for dependence on sedative/hypnotic drugs, stimulants, cocaine, or opiates; (5) report no intravenous drug use for the past 6 months; (6) report no current acute suicidality; (7) report no current residential instability; (8) indicate no current acute psychosis or severe organic impairment; and (9) report that they anticipated no more than 6 hours of involvement in other non-self-help treatment during participation in Project MATCH. Detailed information about the sample, assessments, and treatments has been reported previously (see Babor and Del Boca, 2003).

The present study focused on patients in the outpatient sample who provided usable data on measures of alcohol consumption at baseline and 1 year after treatment completion. This subsample represents 879 of the 952 (92.3%) Project MATCH outpatients. Data on therapeutic alliance were available for 785 (89.3%) of the subsample (or 82.5% of the entire sample). Prior research on therapeutic alliance in Project MATCH indicates that outpatients with complete data on measures of therapeutic alliance were representative of the overall outpatient Project MATCH sample, with the one exception that they were more likely to be married than were those without complete data (Connors et al., 1997).

Measures

Drinking behavior. Drinking behavior was measured by interview at baseline, at 3 months (end of treatment), and at 6, 9, 12, and 15 months after treatment initiation using the Form 90 (Miller, 1996). The Form 90 contains questions about the quantity and frequency of alcohol consumed each day for the 3 months prior to treatment entry or the 3 months prior to follow-up. Estimates of percent days abstinent (PDA) and drinks per drinking day (DDD) were obtained by this measure. Reliability ratings of good to excellent were reported for PDA and DDD in this sample (Tonigan et al., 1997). Because both PDA and DDD were skewed, and to ensure that our data were consistent with those in other published reports from Project MATCH, transformed versions of these variables (i.e., arcsine transforma-

tion for PDA and square root transformation for DDD) were used in all analyses (for more information, see Project MATCH Research Group, 1997).

Alcohol Abstinence Self-Efficacy (AASE) scale. The AASE (DiClemente et al., 1994) is a 20-item scale that contains questions that ask individuals to estimate their level of confidence in their ability to abstain from drinking in high-risk situations on a 5-point scale (from 1 = not at all confident to 5 = extremely confident). A high level of internal consistency (Cronbach's α = .93) of the AASE in this sample has been reported previously (DiClemente et al., 2001).

Working Alliance Inventory (WAI). The WAI (Horvath and Greenberg, 1986) is a 36-item measure of the patient's capacity to engage actively in treatment and the patient's experience of the therapeutic relationship as helpful. Both the patient and the therapist provided ratings of the therapeutic alliance on the WAI. This measure yields three subscales (related to agreement on the goals of therapy, agreement about the tasks of therapy, and the bond between therapist and patient) and a total score. The WAI demonstrated good internal consistency, with correlations between subscales and the total score ranging from .87 to .96 (Connors et al., 1997). Consistent with past research with the WAI on this sample (Connors et al., 1997), the total scores for patients and therapists reported after the second session of therapy (during the second week of treatment for all treatment conditions) were used here. As noted by Connors et al. (1997), this was done (1) to minimize missing data, (2) to allow the time of assessment to be similar in all treatments, (3) to allow for at least two sessions for therapist and patient to develop a relationship, and (4) because past reports indicate that the WAI yields a general measure of therapeutic alliance on a single dimension (Tracey and Kokotovic, 1989).

Type of treatment and number of sessions. Type of treatment was determined by random assignment to one of the three Project MATCH conditions; this information was available on all patients. Treatment providers reported information about the number of treatment sessions attended by each patient. For the present analyses, treatment condition was coded using centered orthogonal contrasts. Number of treatment sessions was transformed to represent the ratio of number of treatment sessions attended divided by number available (i.e., the number of sessions was divided by 12 for CBT and TSF, and divided by 4 for MET).

Analysis plan

First, measures of abstinence self-efficacy, therapeutic alliance, and 1-year alcohol-related outcomes were intercorrelated to specify the strength of their associations. Next, regression analyses were conducted in which the predictors were baseline self-efficacy, therapeutic alliance, and the interaction of self-efficacy and therapeutic alliance, and the outcomes were PDA or DDD at 1 year. Baseline values of the dependent variable and treatment type were included in the equations as covariates. Separate analyses were conducted for patient rating and therapist rating of therapeutic alliance. All continuous variables were median-centered, and categorical predictors were centered using the procedures outlined in Kraemer and Blasey (2004).

Results

Interrelationships between self-efficacy, therapeutic alliance, and 1-year alcohol use

Correlations between abstinence self-efficacy, therapeutic alliance, and 1-year alcohol-related outcomes are shown in Table 1. Higher abstinence self-efficacy at baseline was significantly related to higher PDA and lower DDD at 1-year follow-up. Patients' ratings of therapeutic alliance were significantly associated with higher PDA, and therapists' ratings of therapeutic alliance were significantly associated with both higher PDA and lower DDD. Higher self-efficacy was not significantly associated with either patient or therapist ratings of therapeutic alliance.

Interaction between self-efficacy and therapeutic alliance in predicting 1-year alcohol use

In a first set of regression analyses using therapists' report of therapeutic alliance, the main effect of therapeutic

TABLE 1. Intercorrelations and 95% confidence intervals for measures of self-efficacy, therapeutic alliance, and alcohol-related outcomes at 1-year

	1.	2.	3.	4.	5.
1. Intake AASE	–	-.03 (-.10–.04)	.00 (-.07–.07)	.10† (.03–.17)	-.09† (-.16– -.02)
2. Therapist WAI		–	.25† (.18–.32)	.11† (.04–.18)	-.11† (-.18– -.04)
3. Client WAI			–	.08* (.01–.15)	-.05 (-.12–.02)
4. 1-year PDA				–	-.70† (-.74– -.66)
5. 1-year DDD					–

Notes: AASE = Alcohol Abstinence Self-Efficacy; WAI = Working Alliance Inventory; PDA = percent days abstinent; DDD = drinks per drinking day.
*$p < .05$; †$p < .01$.

alliance was significant in predicting PDA, as was the interaction between self-efficacy and therapeutic alliance (Table 2). The results of the regression equation predicting DDD present a similar picture. Again, the main effect of therapist ratings of therapeutic alliance and the interaction of self-efficacy and therapeutic alliance were significant.

In a second set of regression analyses, a significant main effect was found for patient perceptions of the therapeutic alliance in predicting PDA (Table 2), but no significant interaction effects were identified. When self-efficacy, patient rating of therapeutic alliance, and their interaction were used to predict DDD, no significant main effects or interaction effect emerged.

Figures 1 and 2 present data on the interaction between baseline self-efficacy and therapist WAI for PDA and DDD, respectively. Nontransformed data are presented in the figures; low, medium, and high groups represent ± 1 SD from the mean for self-efficacy and therapist's report of therapeutic alliance. Both figures indicate that therapeutic alliance as perceived by the therapist was not significantly related to a drinking outcome among patients with high self-efficacy. However, as self-efficacy decreases, the relationship between therapeutic alliance and treatment outcomes becomes stronger. It is important to note that although the size of the interaction effect is statistically modest, examination of the figures indicates that individuals with low self-efficacy and high therapist-rated alliance consume one and a half fewer DDD and are abstinent on 10% more days during the follow-up than those with low self-efficacy and low therapist-rated alliance.

Supplementary analyses

We conducted several additional analyses to examine the role of treatment compliance (as measured by a ratio consisting of treatment sessions attended divided by number of available sessions) in the primary analyses presented in Table 2. First, attendance was entered into the primary analyses as a covariate. In all instances, the relationship between self-efficacy, therapeutic alliance, and the interaction

TABLE 2. Results of regression analyses predicting percent days abstinent (PDA) and drinks per drinking day (DDD) at the 1-year follow-up

	PDA		DDD	
Variable	*B*	Individual variable change in R^2	*B*	Individual variable change in R^2
Analyses of therapists' ratings of alliance				
Covariates				
Baseline dependent variable	.04†	.10	.11*	.01
Treatment type 1 (CBT vs MET and TSF)	.04	.00	-.15	.00
Treatment type 2 (MET vs TSF)	.14*	.01	-.31	.00
Self-efficacy and alliance				
Self-efficacy	.05*	.01	-.12	.01
Therapist rating of alliance	.00†	.02	-.01†	.02
Self-Efficacy × Therapist Rating of Alliance	-.00*	.01	.01*	.01
Constant	1.13		1.53	
R^2	.14		.04	
Analyses of patients' ratings of alliance				
Covariates				
Baseline dependent variable	.38†	.09	.12*	.01
Treatment type 1 (CBT vs MET and TSF)	.04	.00	-.14	.00
Treatment type 2 (MET vs TSF)	.13*	.01	-.23	.00
Self-efficacy and alliance				
Self-efficacy	.04*	.01	-.10	.00
Patient rating of alliance	.00*	.01	-.00	.00
Self-Efficacy × Patient Rating of Alliance	.00	.00	-.00	.00
Constant	1.13		1.54	
R^2	.11		.02	

Notes: CBT = Cognitive Behavioral Treatment; MET = Motivational Enhancement Therapy; TSF = Twelve-Step Facilitation.
*$p < .05$; †$p < .01$

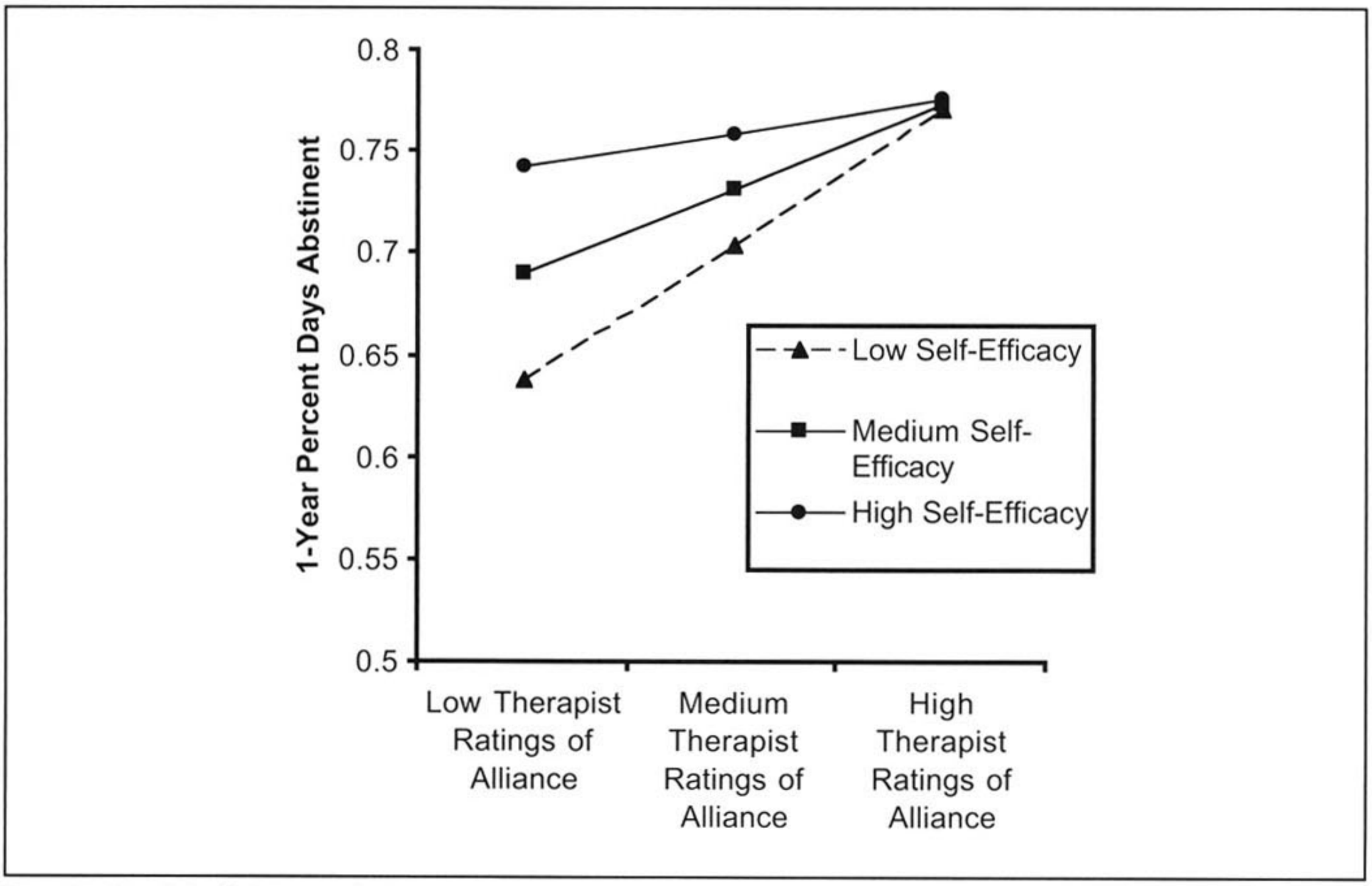

FIGURE 1. The relationship between self-efficacy, therapist ratings of the alliance, and percent days abstinent at 1 year

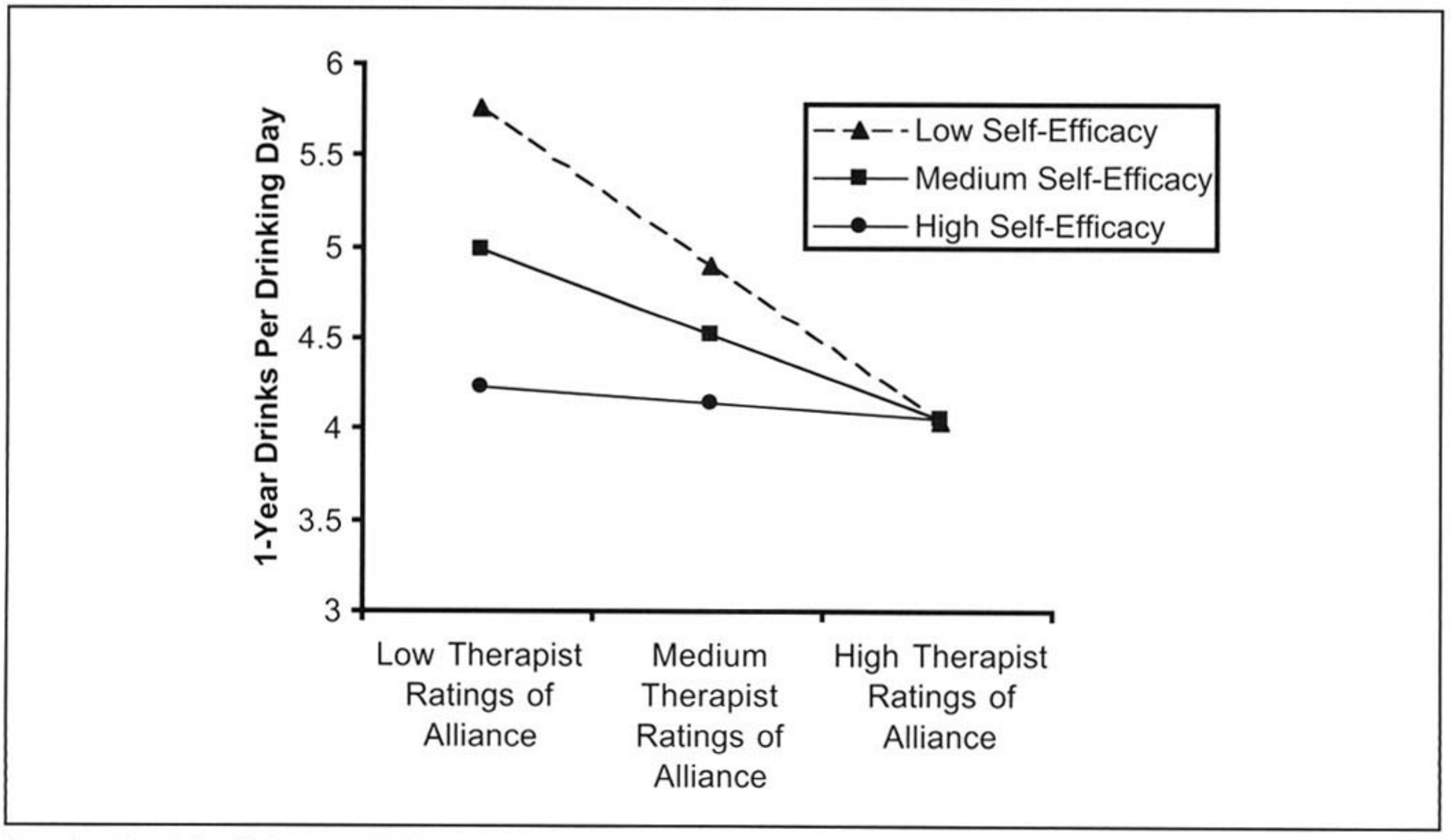

FIGURE 2. The relationship between self-efficacy, therapist ratings of the alliance, and drinks per drinking day at 1 year

between self-efficacy alliance was unchanged. Secondly, a series of multiple regression analyses was conducted to examine whether attendance may be a mediator of the effect of the interaction between self-efficacy and therapists' ratings of alliance on outcomes. These analyses followed the procedures for examining mediators of interaction effects outlined by Baron and Kenny (1986) and described in detail by Finney (1995). The results indicated that attendance did not significantly mediate the effect of the interaction between self-efficacy and therapeutic alliance on either PDA or DDD.

Discussion

Consistent with prior research on Project MATCH (DiClemente et al., 2001) and other samples (e.g., Rychtarik et al., 1992), both higher self-efficacy and a stronger therapeutic alliance predicted better 1-year alcohol-related outcomes. More importantly, the present findings indicate that—even after controlling for baseline alcohol use, treatment type, and treatment attendance—the quality of the therapeutic relationship, as perceived by the therapist, interacted with self-efficacy to predict treatment outcomes. Specifically, the findings show that the quality of the therapeutic relationship (as judged by the therapist) may be particularly important for patients who enter treatment with low abstinence self-efficacy. Also, as is desirable for a moderator variable (Baron and Kenny, 1986; Kraemer et al., 2002), self-efficacy was not associated with therapeutic alliance.

These results supplement known findings on the relationship between abstinence self-efficacy and substance use disorder treatment outcomes. First, the results underscore the importance of examining both the relationship between abstinence self-efficacy and treatment outcomes, and factors that may influence the strength of this relationship (Ilgen et al., 2005; Levin et al., submitted for publication). Accordingly, although higher self-efficacy is generally associated with better treatment outcomes, the relationship between self-efficacy and outcomes is not uniform. To the best of our knowledge, the present study is the first to demonstrate that a specific treatment factor (i.e., the quality of the therapeutic relationship) interacts with baseline self-efficacy to predict outcome. Specifically, if patients with low self-efficacy established a strong therapeutic alliance, as perceived by their therapist, they had 1-year alcohol use outcomes that were comparable with those of patients who had high self-efficacy.

Past results from Project MATCH have indicated that no specific *type* of treatment is particularly beneficial for patients with low self-efficacy (DiClemente et al., 2001; Project MATCH Research Group, 1997). More generally, given the few significant findings regarding hypothesized interactions between type of treatment and patient characteristics, the Project MATCH Research Group (1997) speculated that patient-treatment matching might more likely involve different settings for different types of patients or higher-order interactions (i.e., combinations of patient characteristics interacting with treatment dimensions). Our results indicate that variation within treatment types in the quality of treatment (specifically, the quality of the therapeutic relationship) may be another fruitful avenue to pursue. The present findings identify a form of patient-treatment matching based more on the *quality* of the therapeutic experience than on the specific *type* of treatment provided. Examination of interactions between specific patient attributes and common, but varying, components of treatment is a novel approach for the AUD research field and may provide useful clues for effective patient-treatment matching strategies.

Patients with low self-efficacy seem to be particularly well matched to therapeutic relationships in which therapists perceive high agreement with patients about the goals and tasks of therapy, as well as a strong bond with patients. The quality of the therapeutic alliance may be less important in the treatment of patients with high self-efficacy. These findings are consistent with the idea that patients with low self-efficacy are more susceptible to external influences (either positive or negative) than are patients with high self-efficacy (Bandura, 1997). For patients with low self-efficacy, the bond with their therapist may counteract their pessimism about the likelihood of succeeding in treatment and lead to greater investment in the treatment process and, consequently, improve their long-term treatment outcomes.

We examined the role of treatment compliance as a possible mediator of the significant interaction between self-efficacy and therapists' ratings of alliance. No evidence was found for the role of compliance as a mediator and, thus, we can only speculate on the reasons why therapeutic alliance has a differential influence on the outcomes of patients who vary in self-efficacy. During the course of treatment, patients with high self-efficacy may develop the necessary coping skills to succeed in spite of a more distant therapeutic relationship, whereas patients with low self-efficacy may fail to develop the resources needed to compensate for a poorer bond with the therapist. Also, therapists' positive ratings of the therapeutic relationship may reflect the therapists' sensitivity or overall optimism about the patient, which may be particularly influential for patients with low self-efficacy.

Additionally, consistent with past results from Project MATCH (Connors et al., 1997), the overall strength of the relationship between therapist ratings of alliance and outcome is somewhat stronger than the relationship between patient ratings of alliance and outcome. These results may reflect a weakness of the measure of patients' perceptions of the alliance. Also, the modest correlation between the

therapist and patient WAI components suggests that the two instruments may be measuring two distinct constructs. Because of the demonstrated effect of therapists' perception of the patient on therapists' behavior and treatment outcomes (Leake and King, 1977), it is possible that the way the therapist views the quality of the relationship is more important than the patient-perceived quality of the bond. In any case, the greater overall strength of this predictor raises the likelihood that therapists' perceptions of therapeutic alliance can overcome the deficits associated with low self-efficacy in patients.

Although these findings have important implications, several limitations of the present study warrant discussion. First, the nature of the present analyses does not allow us to determine whether increases in alliance *caused* the improvements in outcomes seen in patients with low self-efficacy. Similarly, to some extent, the therapist ratings of therapeutic alliance after two sessions of treatment may reflect the patients' level of self-efficacy at that time. More research is needed to disentangle the influence of patients' changing levels of self-efficacy and variations in therapeutic alliance during treatment. Additionally, the selection criteria for participants and the close monitoring of treatment providers in Project MATCH may have influenced the levels of self-efficacy and therapeutic alliance, and decreased the generalizability of the present results to other settings. On the other hand, greater homogeneity caused by such research features would operate to reduce, not strengthen, the interaction effects that we found.

One unexpected finding was that the comparison of MET with TSF was significantly associated with both DDD and PDA in two of the four primary analyses. At first look, these results appear to be inconsistent with other results from Project MATCH (Project MATCH Research Group, 1997) that indicate no main effect for type of treatment. However, it is important to note that this significant treatment effect was only found when self-efficacy, a measure of alliance, and the interaction between these variables were entered in the same multiple regression equation. Thus, the present results reflect only the influence of treatment type after controlling for these other factors, not the unadjusted effect of MATCH treatment assignment.

The overall strength of the findings is modest; however, the strength of the relationship is similar to other findings based on Project MATCH data (Connors et al., 1997). The modest association between baseline self-efficacy and treatment outcomes may reflect the timing of the self-efficacy assessment. This is consistent with the previous finding in Project MATCH that end-of-treatment self-efficacy was more closely related to drinking at 1 year than was intake self-efficacy (DiClemente et al., 2001). Nevertheless, increases in therapeutic alliance were associated with clinically meaningful improvements in patients with low self-efficacy. Finally, the fact that treatment attendance did not mediate the effects of the interaction between self-efficacy and therapists' ratings of alliance highlights the need to continue to search for an explanation of this finding.

Despite these limitations, the present findings have important potential implications for clinicians and researchers. Patients with low self-efficacy at entry to treatment represent high-risk individuals who may respond especially positively to a high-quality therapeutic relationship. These individuals are not only appropriate for targeted interventions, but may be particularly responsive to some of the common elements of treatment. The fact that self-efficacy does not predict alliance indicates that low self-efficacy does not interfere with patients' ability to effectively establish a strong therapeutic relationship. Avoiding confrontation and clearly stating the goals of treatment may increase relationship quality, investment in treatment, and, eventually, better treatment outcomes (Lebow et al., 2006). These and other similar techniques may help to strengthen the therapeutic relationship for patients who start AUD treatment lacking confidence in their ability to maintain abstinence.

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