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Client Anger as a Predictor of Differential Response to Treatment

Holly Barrett Waldron, Ph.D., William R. Miller, Ph.D., and J. Scott Tonigan, Ph.D.

ABSTRACT

This client-treatment matching study examined the a priori matching hypothesis for a differential effect of client anger on treatment outcome for three treatments for clients with alcohol abuse or dependence: Motivational Enhancement Therapy (MET), Cognitive-Behavioral Coping Skills Therapy (CBT), and Twelve Step Facilitation (TSF). The findings provide strong support for the matching hypothesis. For outpatient clients higher in pretreatment anger, MET was associated with significantly more abstinence and less intense drinking, compared to CBT and TSF. These results indicate a distinct advantage in assigning angry outpatients to MET. Also, clients low in anger fared better in CBT and TSF than in MET, reflected in the disordinal rather than ordinal matching interaction. Results of analyses examining why the matching effect occurred were less clear. Process variables expected to underlie the differential effectiveness (attendance, treatment satisfaction, and therapeutic alliance) did not mediate the observed interaction. However, there was support for resistance as an important variable within the matching effect. Implications for the matching findings, the different pattern of findings for outpatients and aftercare clients, and future directions for pursuing the causal chain associated with the matching effects are discussed.

Anger is a basic negative human emotion defined as an internal, subjective feeling state with associated negative cognitions and physiological arousal patterns, the experience of which can vary in intensity and fluctuate over time in response to the environment (Spielberger et al. 1983; DiGiuseppe et al. 1994). Anger is differentiated from other emotions through a labeling process based on perceived stimulus conditions that evoke the emotion and/or on the inclinations to act which are associated with the emotion (Berkowitz 1990). Labeling an emotion as anger may occur when interference with goals, a physical or psychological threat, or an intentional misdeed are perceived, or when expectations or attitudes are incongruent with the environment. An emotion that gives rise to motivation to respond to these perceptions (e.g., defend the self, change the environment, prevent mistreatment, or seek revenge on others) may also be labeled as anger (Edmondson and Conger 1996).

Anger can be conceptualized as having two components: (1) the general tendency or disposition (trait) of the individual toward anger that remains relatively stable across situations and (2) the feeling state of anger that fluctuates as a function of situational factors in the environment and the individual's tendency toward anger (Spielberger 1988).

The concept of hostility, often used interchangeably with anger, is quite similar to Spielberger's notion of trait anger. Hostility has

Holly B. Waldron, Ph.D.
UNM Center for Family and Adolescent Research
2700 Yale SE
Albuquerque, NM 87106
E-mail: hwaldron@unm.edu

been defined as a personality trait characterized by the chronic display of angry affect and aggressive behaviors (DiGiuseppe et al. 1994). Thus, hostility reflects a combination of angry emotion and action. The rationale for the present matching hypothesis integrates theoretical and empirical literatures investigating anger and/or hostility, combining trait and state conceptions.

Rationale for Matching Hypothesis

Anger is common in ongoing interpersonal relationships (Averill 1982). Research has revealed a broad spectrum of negative concomitants of anger and of hostility, including impaired cognitive functioning (Laird et al. 1982; Jaderlund and Waldron 1994), ill health (Barefoot et al. 1983; Diamond 1982; Smith et al. 1990), verbal or physical aggression (Maiuro et al. 1988; Margolin et al. 1988), impaired peer relationships among children (Dodge et al. 1986), and disturbed marital and family relationships (Gottman and Krokoff 1989; Patterson 1985). Moreover, hostility has been shown to preclude productive problem-solving and communication skills training and lead to poorer therapy outcome (Alexander et al. 1989; Barton et al. 1985; O'Donnell and Worrell 1973).

Clients entering treatment frequently present with anger problems (Deffenbacher et al. 1994). According to DiGiuseppe and his colleagues (1994), angry clients generally do not seek treatment for help in changing their angry response into a healthier one; instead, they are often motivated to try to change the target of their anger rather than themselves. They tend to view their anger as justified, not deviant. Moreover, angry clients often deny that their anger is a problem and may be more resistant to treatment, rendering them more difficult to treat.

The therapeutic alliance can also be compromised by client anger. The success of the therapeutic alliance depends on the formulation of a bond based on warmth, acceptance, and trust between therapist and client and on their agreement on tasks and goals of therapy (Bordin

1976). A therapist's attempts to change a client's anger may be perceived by the client as the therapist's disbelief that the client was wronged or that some transgressor was responsible for the problem (Walen et al. 1992). As a result, angry clients may have more difficulty forming a therapeutic bond and are less likely to reach agreement on goals of therapy than clients with other emotional problems. Angry clients may also be especially prone to responding defensively during therapy when exposed to direction or confrontation, therapist behaviors that have been shown to increase client resistance (Miller et al. 1993; Patterson and Forgatch 1985).

Resistance in Therapy

Client resistance has traditionally been considered a theoretically important process variable in the psychotherapy literature. The concept of resistance is one of the cornerstones of psychoanalytic theory, which holds that "working through" clients' reluctance to give up their symptoms is central to the process of change (Wolberg 1967). In the behavior therapy literature, resistance is often framed as client noncompliance, with therapists responsible for ensuring compliance in their prescription of therapeutic tasks (Hersen 1971).

Family theorists have viewed resistance as inherent in the change process because families attempt to maintain homeostasis in their relationship functioning (Aponte and VanDeusen 1981) or as the therapist's failure to attend adequately to cognitive or interpersonal relationship factors before implementing a behavior change plan (Alexander and Parsons 1982; Waldron and Slesnick 1998). In general, resistance has been attributed to a variety of sources, including factors that reside within individual clients (including anger), the product of an interpersonal interaction between therapist and client, the contribution of external environmental factors such as court-mandated treatment, limited efficacy of therapeutic practices, or a lack of therapist skill (Anderson and Stewart 1983; Lazarus and Fay 1982; Robin and Foster 1989).

Overt anger, argumentativeness, and oppositionality have been suggested as ways in which resistance can be manifested in therapy

(Anderson and Stewart 1983; Newman 1994), although actual research making this connection has been rare. However, Chamberlain and her colleagues (1984) provide some support for the notion that pretherapy levels of anger may influence client resistance in therapy. These investigators found higher levels of resistance in agency-referred clients versus self-referred clients, and this resistance was associated with poorer treatment outcome. Possibly, clients who are referred for treatment by an agency (e.g., through the court system) are more defensive about their problems and respond to treatment with more resistant behaviors, such as denial of responsibility and projection of blame onto others.

Clients vary considerably in their presenting levels of resistance to therapy (Brehm 1972; Hersen 1971; Anderson and Stewart 1983). Client resistance, in turn, has been shown to be predictive of premature termination (Chamberlain et al. 1984; Kolb et al. 1985) and poorer treatment outcomes (Burns and Nolen-Hoeksema 1991; Kolb et al. 1985; Miller et al. 1993; Orlinsky et al. 1994) across treatment models and client populations. In the areas of addictive behaviors, lack of compliance and failure to persist in treatment are particularly problematic (Clancy 1961; Dicicco et al. 1978). For example, Miller et al. (1993) showed that problem drinkers who were more resistant during treatment, as evidenced by inattention, silence, changing the subject, or other negative responses such as denying responsibility for drinking, had higher levels of alcohol consumption a year after therapy had ended.

Therapist Behaviors and Treatment Outcome

A number of therapist behaviors have also been shown to influence therapy outcome. For example, therapist supportiveness and empathic style have been related to client improvement in therapy (Orlinsky and Howard 1986), whereas therapist confrontation and defensive style have been related to less favorable outcomes (Alexander et al. 1976; Beutler et al. 1984; Waldron et al. 1997). In general, these same therapist behaviors have been associated

with client resistance during treatment. For example, positive therapist attributes and behaviors such as warmth, support, and reframing appear to be related to more cooperative responding in therapy (Alexander et al. 1976; Barbera and Waldron 1994; Patterson and Forgatch 1985; Robbins et al. 1996). Patterson and Forgatch (1985) also found that teaching and confronting (i.e., directive) behaviors were related to increased client resistance in the second session of family therapy.

The same pattern of findings has been shown in research on alcohol treatment. Among problem drinkers, empathic therapist style has been associated with favorable long-term treatment outcomes (Miller and Baca 1983; Miller et al. 1980; Valle 1981). Conversely, Milmoe and associates (1967) found that therapists' hostile vocal tone predicted reduced treatment effectiveness for alcoholics, and Miller et al. (1993) found that a directive-confrontational style yielded significantly more resistance from clients, which in turn predicted poorer long-term outcome.

Motivational Enhancement Therapy (MET)

As a treatment approach, MET specifically targets client resistance and has as its primary goal the mobilization of clients' commitment to change (Miller and Rollnick 1991; Miller et al. 1992). A variety of strategies are prescribed to defuse and decrease resistant client behavior, including avoiding argumentation, expressing empathy, and providing the client with choices in therapy. Other strategies are applied to evoke clients' own self-motivational statements of problem recognition, concern, need for change, and self-efficacy. Self-efficacy is viewed as essential to the process of change. According to Miller and Rollnick (1991), a client who perceives a threat or problem but does not believe that change is possible, will likely become defensive and turn toward denial or resistance instead of behavior change.

This emphasis on creating and eliciting motivation for change distinguishes MET from the other approaches examined by Project MATCH: Cognitive-Behavioral Coping Skills Therapy (CBT; Kadden et al. 1992) and Twelve Step

Facilitation (TSF; Nowinski et al. 1992). The proposed anger hypothesis provides a unique challenge for MET. If MET is a successful approach for increasing motivation, then clients who are more resistant to treatment, by virtue of their higher levels of anger, should fare better in this treatment specifically formulated to de-escalate resistance than in treatments which do not have this specific emphasis.

The Hypothesized Matching Contrast

A single between-group hypothesis was proposed with regard to the interaction of client anger with treatment modalities in influencing outcomes. Expressed in relation to the dependent variable of total alcohol consumption, the hypothesis was that *clients high in anger will show significantly greater reduction in alcohol consumption when treated by MET than by either CBT or TSF. No difference between treatments was expected for clients low in anger.*

This predicted interaction was expected because MET is designed specifically to reduce client resistance and enhance motivation, whereas both CBT and TSF are more directive and action-oriented methods. The matching effect was expected to occur via a causal chain including the following steps:

- Angry clients have poorer treatment outcomes because they tend to be resistant to change.

- MET is designed to diffuse resistance, while CBT and TSF are more action focused.

- High anger clients should therefore fare better when assigned to MET relative to assignment to CBT and TSF.

Noteworthy, the causal model does not propose any changes in client anger associated with treatment assignment. High anger clients may remain so even when assigned to the MET therapy. The important point is that MET is intended to focus upon the resistance of angry clients not on their anger per se.

Operationalization of the Matching Variable

The State-Trait Anger Expression Scale (STAX) was used to measure client anger. This 44-item instrument was designed to measure angry emotion as a situational response (state) and as a disposition (trait) of an individual (Spielberger 1988). The STAX is composed of eight subscales (State-Anger, Trait-Anger, Trait-Temperament, Trait-Reaction, Anger-In, Anger-Out, Anger-Control, and Anger-Expression) as well a total anger score which was used to define the matching variable in this study. Spielberger (1988) reported subscale coefficient alphas ranging from 0.84 to 0.93, indicating adequate internal consistency of the measure. Studies examining the validity of the STAX scales have also supported the psychometric strength of the instrument (cf. Spielberger 1988). The total anger score was used as the continuous matching variable in this study.

Alcohol Consumption

Drinking outcomes were assessed by the two primary dependent variables selected for Project MATCH (1993, 1997a): percentage of days abstinent (PDA) during each followup interval and the average number of drinks per drinking day (DDD, with abstainers coded as zero). Research interviews were completed at 3, 6, 9, 12, and 15 months after intake and (at seven outpatient sites) at 39 months as well. Over 90 percent of cases were interviewed for each followup interval.

Causal Chain Variables

The logic of the causal model was straightforward: angry clients tend to have poorer outcomes because they are resistant to change. MET diffuses this negative aspect of client resistance while CBT and TSF exacerbate resistance because of their action focus. Central to testing the causal model was the development of a measure reflecting client resistance. No a priori measure was included in the Project MATCH baseline assessment battery to measure resistance to change. Several measures,

however, were included to assess client motivation for change (e.g., SOCRATES; Miller and Tonigan 1996). Logically, two SOCRATES subscales—Recognition of problem and Taking Steps toward change—represent the *antithesis* of client resistance. In the absence of a more direct measure of resistance, we selected these two subscales as reverse proxies for client resistance (e.g., anger and problem recognition should be negatively correlated at baseline).

Results

Complete intake data needed for computation of the anger score were provided by 94 percent ($n=896$) of the outpatient and 95 percent ($n=734$) of the aftercare samples. On average, aftercare clients reported significantly higher anger ($M=30.81$, $SD=7.63$) than did outpatient clients ($M=29.46$, $SD=7.25$), $t(1,628)=3.68$, $p<.0002$, but the absolute difference in mean values (about one item) was not considered clinically meaningful. No mean differences in baseline anger were found among the three randomly assigned outpatient treatment conditions, $F(2, 893)=1.71$, $p<.18$. Female outpatient clients reported somewhat higher anger than did their male counterparts, $t(894)=2.03$, $p<.04$. In the aftercare sample, no mean differences in baseline anger were found among treatment conditions, $F(2, 731)=0.42$, $p<.66$, or between genders, $t(732)=1.04$, $p<.30$.

Finally, and in both outpatient and aftercare samples, baseline anger was significantly ($p<.001$) and positively related with other client matching variables discussed in this monograph, including overall psychiatric severity (outpatient $r=0.31$, aftercare $r=0.24$), meaning-seeking (outpatient $r=0.43$, aftercare $r=0.40$), alcohol dependence (outpatient $r=0.26$, aftercare $r=0.23$), antisocial personality disorder (outpatient $r=0.26$, aftercare $r=0.23$), sociopathy (outpatient $r=0.37$, aftercare $r=0.40$), and motivation for change (SOCRATES; outpatient $r=0.15$, aftercare $r=0.16$).

Outpatient Sample

Prognostic Effects of Anger

The main effect of client anger on posttreatment drinking was examined using several analytical techniques. Zero-order and second-order partial correlations were computed to show the extent of association between anger and proximal posttreatment drinking (months 4–9), not taking into account variation in posttreatment drinking attributable to site and treatment conditions. The prognostic effects of client anger were also examined in the context of hierarchical linear modeling (HLM) in which site, treatment, and linear and quadratic time main effects as well as their product terms with each other and with anger were included in the omnibus model.

Contrary to prediction, clients' anger level measured at intake was not related to frequency ($r=-0.01$, $p<.84$) or intensity $r=0.01$, $p<.71$) of drinking during the first 6 months after treatment. Controlling for intensity and frequency of drinking at intake, second-order partial correlations also reflected no significant relationship of anger to drinking during followup. In the HLM context, no prognostic effect of anger was found using monthly values of frequency ($p<.75$) and intensity ($p<.89$) of drinking during posttreatment months 4–12. Post hoc analysis indicated that anger and PDA were weakly and negatively related in two sites ($r=-0.10$ and -0.11) and virtually unrelated in the three remaining sites ($r=0.08$, 0.04, and 0.02).

Tests of the Anger Matching Hypothesis

The a priori hypothesis stated that clients higher in anger at intake would fare better (higher PDA and fewer DDD) during posttreatment when assigned to MET relative to similar clients assigned to the combined CBT and TSF conditions. The analytic strategy for testing of the a priori hypotheses has been described in detail elsewhere and will only be briefly outlined here (Project MATCH 1993, 1997a, b; Longabaugh and Wirtz, this volume, pp. 4–17).

HLM was used to test the secondary matching hypothesis, and three statistical tests were conducted to evaluate the parallelism of the two slopes representing the relationship between anger and a primary outcome measure by the specified treatment contrast, here MET versus CBT and TSF combined.

One of these tests examined whether the two slopes were parallel and, if not, if nonparallelism was in the predicted direction. Importantly, this test collapsed the *12 months of followup* and can be interpreted as an omnibus test of whether the predicted match was present for the *entire* 12 months of followup. The second and third statistical tests evaluated whether a finding of nonparallelism varied across the 12 months of followup in a linear or quadratic fashion, and rejection of the null hypothesis for these tests led to post hoc monthly contrasts to identify the months in which the predicted match was manifest.

For exploratory purposes, this same analytical strategy was used to examine potential client anger matching during the 12 weeks of treatment. The only difference between the posttreatment and within-treatment analyses was that the former used monthly drinking values and the latter used weekly PDA and DDD values. Finally, a 3-year followup was conducted for the outpatient sample, and matching findings have been reported elsewhere (Project MATCH Research Group 1998). A classical MANCOVA approach was used to test predicted matching hypotheses with the 3-month interval before the distal interview providing outcome data for the matching analyses in the outpatient sample. Time was not included in the model as a within-client factor.

Results of all prospective tests of the client-anger matching hypothesis are reported in table 1 under the column labeled, "Planned matching contrast." Columns to the right, labeled "Unplanned matching contrasts," show the pairwise

Table 1. State-trait secondary matching findings in the Project MATCH outpatient sample: Planned and unplanned matching contrasts (probability values)

	Planned matching contrast	Unplanned matching contrasts		
	[MET vs. CBT and TSF]	[MET vs. CBT]	[MET vs. TSF]	[CBT vs. TSF]
During treatment				
PDA	.11	.06	.39	.26
PDA (linear)	.23	.42	.20	.65
PDA (quadratic)	.12	.29	.10	.58
DDD	.31	.39	.36	.97
DDD (linear)	.25	.59	.14	.37
DDD (quadratic)	.51	.63	.50	.87
Twelve months posttreatment				
PDA	.01	.02	.12	.44
PDA (linear)	.69	.65	.82	.81
PDA (quadratic)	.30	.83	.11	.16
DDD	.01	.06	.03	.85
DDD (linear)	.95	.72	.60	.88
DDD (quadratic)	.95	.81	.89	.70
Extended 39-month followup				
PDA	.001			
DDD	.002			

PDA = percentage of days abstinent
DDD = drinks per drinking day

treatment matching contrasts. These contrasts were not prospectively specified and are provided as exploratory analyses. The top portion of the table shows the probability values associated with the matching hypothesis tests during the within-treatment phase of the study. As shown, no support was found for client-anger matching during the 12 weeks of treatment in the outpatient sample.

Strong support was found for the client-anger matching hypothesis, however, for the 12 months *posttreatment*. Here, the omnibus HLM matching hypothesis was supported on both primary dependent measures (PDA $p<.014$ and DDD $p<.011$). Examination of figure 1 shows a disordinal interaction of anger with both PDA and DDD by the specified contrast. As predicted, and throughout the entire 12-month followup period, clients higher in initial anger had higher PDA and lower DDD when assigned to MET, relative to high anger clients assigned to CBT and TSF. In absolute magnitude, for clients at the highest decile of anger, a 9-percent difference in PDA was obtained between MET and the combined CBT/TSF groups, and 1.2 fewer drinks were consumed on drinking days
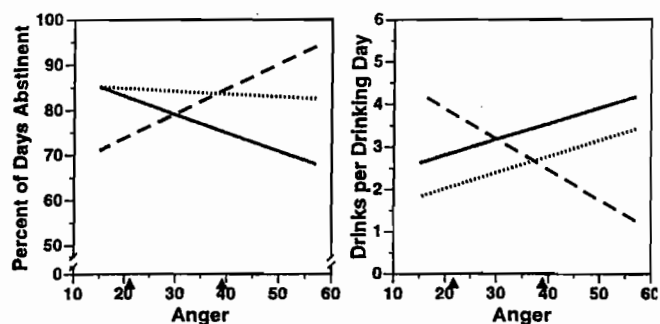
Figure 1. Posttreatment plot of percentage of days abstinent and drinks per drinking day showing the interaction between the three Project MATCH treatments and anger, in the outpatient arm. The vertical axes represent predicted outcome scores and the horizontal axes represent baseline anger, with higher scores indicating higher anger. The triangles on the horizontal axes indicate the 10th and 90th percentiles for anger in this study arm. Reprinted with permission from *Addiction*, Vol. 92, Issue 12, pp. 1671–1698, 1997. Copyright by Taylor & Francis Ltd., Oxfordshire, UK, http:/www.tandf.co.uk/journals.   (–CBT; - -MET; ...TSF)

when assigned to MET. Not predicted, clients initially lower on anger had significantly fewer abstinent days relative to low anger clients assigned to CBT and TSF and also reported more intense drinking relative to low anger clients assigned to TSF.

Prospective statistical tests provided further strong support for the client-anger matching hypothesis at 3-year followup in the outpatient sample. Again, clients with higher baseline anger assigned to MET reported significantly more abstinent days ($p<.0005$) and drank significantly less intensely ($p<.0015$) than high anger clients assigned to CBT and TSF 3 years after the end of treatment. Not anticipated, but similar to findings in the 12 months immediately after treatment, the interaction was disordinal. Here, at 3 years after treatment ended, low-anger clients assigned to TSF and CBT reported higher PDA and fewer DDD than low-anger clients assigned to MET. Using raw data, the average PDA for the highest third of angry clients assigned to MET was 8.4 percentage points higher than for those assigned to CBT or TSF. Using this same procedure for the lowest third on the anger variable, low-anger clients assigned to CBT and TSF reported, on average, 14.4 percent more abstinent days than low-anger clients assigned to MET.

Causal Chain Analyses

We approached the analysis of our proposed causal mechanisms with enthusiasm. Only two a priori omnibus contrasts were supported by both primary dependent measures across months 4–15 in Project MATCH, and the anger hypothesis was the only such hypothesis supported for the entire 12 months after treatment *and* the extended 3-year followup.

The first step in our analysis was to assess the relationship between baseline client anger and resistance. Our model proposed a positive correlation between these constructs. Because our indicators of resistance were, in fact, antitheses of resistance (SOCRATES: Recognition of the problem and Taking Steps toward change), support for the first link of the causal chain would be evidenced with negative correlations between the two SOCRATES scales and client anger. One of the obtained correlations was

statistically significant but not in the predicted direction. Specifically, client baseline anger was positively and significantly related with Recognition ($r=0.08$, $p<.02$), and Taking Steps was unrelated with client anger ($r=0.03$, $p<.46$).

Inconsistent findings using the two SOCRATES scales led to the search for other variables reflecting client resistance to change. We turned to measures of the client-therapist working alliance (WAI; Horvath and Greenberg 1989) collected at the second week of treatment. This assessment was completed by clients after the second therapy session and inquired about the extent to which clients perceived (1) a bond with the assigned therapist, (2) agreement with treatment goals, and (3) agreement with therapeutic tasks.

Bivariate correlations with these measures partially supported our prediction that angrier clients would be more resistant to treatment. For example, client anger and agreement with therapeutic goals were significantly and negatively related ($r=-0.10$, $p<.008$), anger and bonding were unrelated $r=-0.04$, $p<.26$), and anger and task agreement tended to covary negatively ($r=-0.05$, $p<.18$). We concluded that the first assumption of our model was, at best, partially supported. Clearly, the relationship between client anger and resistance was more complex than we originally conceived, perhaps compounded by our relatively crude proxies of client resistance.

Reduction of resistance in MET was the critical proposed mediating process in our causal model explaining the obtained matching effect. Hierarchical multiple regression analyses (MRA) were therefore conducted to partial out both the main effect of resistance and the resistance by treatment interaction from the single degree of freedom (df) client anger matching test. Substantial support for the proposed causal model would be obtained if inclusion of these two resistance terms in the model eliminated the observed matching effect.

Also included in the model were baseline values of the dependent measure, site, treatment, and anger main effects as well as all first-, second-, and third-order product terms. These analyses used the drinking data for the 12 months posttreatment and, because the

obtained matching effect was not time dependent, we collapsed the 12 monthly values of drinking (PDA and DDD) into single time point outcome measures. Further, because of the complexities in operationalizing resistance, we repeated these analyses five times for each dependent measure (PDA and DDD), using separately each of the five proxy measures of client resistance.

Results of these 10 MRA runs are reported in table 2. As shown, when the dependent measure was PDA, the incremental effect of the single df anger matching contrast was no longer significant after controlling for any one of the five resistance terms. These findings suggest that treatment outcome was mediated in the a priori client anger hypothesis by client resistance— measured five different ways. Less support for the mediational role of client resistance was found using the drinking intensity measure as the dependent variable. Here, only Taking Steps appeared to mediate the treatment outcome, and the remaining four measures of resistance did not appear to mediate treatment outcome in the context of the specified treatment contrast.

Aftercare Sample

Prognostic Effects of Anger

No significant relationship was obtained between baseline anger and frequency ($r=0.06$, $p<.13$) or intensity ($r=-0.05$, $p<.19$) of drinking during the 6 months after treatment. Even smaller relationships were found using second-order correlations controlling for frequency and intensity of drinking for the 90 days before treatment (largest obtained $r=-0.04$, $p<.27$). Controlling for site, time, and treatment main effects and their interactions, HLM analyses also indicated that anger did not predict frequency ($p<.34$) or intensity ($p<.23$) of drinking for aftercare clients during the 12 months after treatment. Unlike the outpatient sample, examination of the replicability of relationships across aftercare sites indicated relative stability of findings and, hence, substantial confidence can be placed in the lack of prognostic importance of anger in predicting posttreatment drinking.

Table 2. Significance of client-anger matching hypothesis tests (PDA and DDD) after separately partialing out five measures of client resistance: Outpatient sample 12 months posttreatment (probability values)

Resistance measure	PDA[1]	Mediators	DDD[2]	Mediators
Recognition of the problem	0.06	**0.001**	0.04	**0.014**
Taking Steps to make changes	0.24	**0.001**	0.18	**0.001**
WAI:				
Therapeutic Bond	0.09	0.118	0.04	0.297
Goal Agreement	0.06	**0.006**	0.02	0.062
Task Agreement	0.08	**0.002**	0.03	0.058

[1] PDA—a summary measure of percentage of days abstinent calculated for the entire 12-month period
[2] DDD—a summary measure of drinks per drinking day calculated for the entire 12-month period
NOTE: Values in columns 1 and 3 after controlling for effects of the index of resistance; columns 2 and 4 computed before controlling for effects of the index of resistance.

Tests of the Anger Matching Hypothesis

The rationale of the client-anger hypothesis and the analytical strategy for testing the prediction were the same for the aftercare and outpatient samples. The aftercare sample did not have an extended 3-year followup, so prospective tests of the hypothesis could only be conducted separately for the 12 weeks of treatment and the 12 months after treatment.

Table 3 presents the results of the prospective HLM tests of the client-anger hypothesis for the aftercare sample. None of the planned matching contrasts supported the client-anger hypothesis (during or after treatment), whether as an omnibus test collapsing time or when time was modeled as a linear or quadratic function.

One concern about combining treatments was that predicted effects may occur in one of the two being combined, but the absence of the predicted effect in the second group may wash out an overall (combined) predicted effect. Examination of the unplanned matching contrasts in table 2 indicates that this concern was

unwarranted for the client-anger hypothesis. None of the unplanned pairwise contrasts was significant either during the 12 weeks of treatment or during the 12 months posttreatment.

Causal Chain Analyses

Complete lack of support for the anger matching hypothesis in the aftercare sample led to an examination of where and how our prediction failed. The first step, of course, was to assess whether baseline client anger related with our measures of resistance to change. In this regard, we again used the two scales of the SOCRATES as reverse proxies of client resistance augmented with secondary measures of client resistance—the three scales of the WAI collected at the second week of therapy.

Bivariate correlations indicated that client anger was unrelated to the Taking Steps scale of the SOCRATES ($r=0.03$, $p<.94$) and significantly and positively related to Recognition ($r=0.13$, $p<.001$). Contrary to our predictions, therefore, angrier clients also tended to report higher Recognition (proxy for lower resistance). This finding is consistent with findings in the outpatient sample.

Unlike the outpatient sample, however, secondary measures of client resistance in therapy did not support our causal model. Specifically, baseline anger was unrelated with client report of therapeutic bond ($r=-0.02$, $p<.72$) and agreement of treatment goals ($r=-0.05$, $p<.27$) and tasks ($r=-0.03$, $p<.52$). Absence of a matching effect in the aftercare sample therefore seems most likely because of a breakdown in the initial rationale underlying the anger hypothesis.

Post Hoc Analyses

Although not specified in the anger matching hypothesis, a question of some import is how, if at all, client anger changed during the treatment phase of the trial. Equally important is the question of whether potential changes in client anger predicted posttreatment functioning.

Table 3. State-trait matching findings in the Project MATCH aftercare sample: Planned and unplanned matching contrasts (probability values)

	Planned matching contrast [MET vs. CBT and TSF]	Unplanned matching contrasts		
		[MET vs. CBT]	[MET vs. TSF]	[CBT vs. TSF]
During treatment				
PDA	.26	.46	.23	.70
PDA (linear)	.91	.78	.93	.72
PDA (quadratic)	.59	.62	.66	.94
DDD	.40	.62	.34	.68
DDD (linear)	.93	.61	.71	.40
DDD (quadratic)	.56	.70	.54	.85
Twelve months posttreatment				
PDA	.18	.25	.67	.46
PDA (linear)	.46	.90	.77	.68
PDA (quadratic)	.23	.61	.43	.81
DDD	.38	.44	.77	.29
DDD (linear)	.13	.26	.40	.75
DDD (quadratic)	.09	.62	.06	.19

PDA = percentage of days abstinent
DDD = drinks per drinking day

Post hoc analyses were conducted to examine these questions in order to gain a better understanding of the anger matching variable used in Project MATCH.

Significant overall reductions in client anger were found between intake and end of treatment in both outpatient and aftercare samples (outpatient: $t(815)=-11.95$, $p<.001$; aftercare $t(632)=-8.56$, $p<.001$). Extent of pre-post change in client anger, however, was not differentially related to treatment group assignment in either the outpatient ($F(2, 813)=0.21$, $p<.81$) or the aftercare sample ($F(2, 632)=0.56$, $p<.57$).

Analyses reported earlier indicated that client baseline anger was not predictive of posttreatment drinking in either the outpatient or the aftercare sample. A related question is, were *changes* in client anger predictive of posttreatment drinking? To this end, bivariate correlations were computed between pre-post treatment change in client anger and 12-month summary measures of PDA and DDD. Treatment groups were collapsed because of the finding that change in anger was unrelated to treatment assignment. In the aftercare sample, anger reduction was unrelated to either drinking intensity ($r=0.00$, $p<.98$) or frequency of abstinent days ($r=-0.02$, $p<.62$) during the 12 months of followup. In contrast, in the outpatient sample, anger reduction was associated with significantly less drinking when drinking occurred ($r=-0.08$, $p<.02$), but not with frequency of abstinent days ($r=0.05$, $p<.19$). Changes in client anger during treatment were unrelated to 3-year drinking on both drinking measures.

Discussion

Strong support was found for the a priori matching hypothesis that drinking outcome would be differentially influenced by the

interaction of client anger and treatment modality. For outpatient clients higher in pretreatment anger, MET was associated with significantly more abstinence and less intense drinking, compared to CBT and TSF. These results indicate a clear advantage in assigning angry outpatients to MET.

Exactly *why* this matching effect occurred remains unclear. Process variables expected to underlie the differential effectiveness (attendance, treatment satisfaction, and therapeutic alliance) did not mediate the observed interaction. Nevertheless, there was support for the causal chain in that the observed matching effect disappeared when any one of five resistance proxies was entered as a covariate. This suggests that resistance was an important variable within the matching effect.

A key may lie in more complex analyses of therapy process to be obtained from detailed coding of session videotapes, where in-session resistance could be measured more precisely. Clients who behave in a hostile manner may, for example, typically elicit more negative responses from their therapists. Snyder and Swann (1978) have shown that hostile expectations generally elicit hostile behavior from interaction partners. In a psychotherapy setting, Pope and Tabachnick (1993) found that therapists experience feelings such as anger with their clients and these feelings may be translated into angry behaviors during therapy. These would be expected to result in an escalation of client resistance, which is associated with poorer client outcomes. Indeed, Miller et al. (1993) found that it was not the presence of positive "motivated" client speech, but the relative *absence* of client resistance that predicted more positive outcomes in MET, and showed that client resistance was under the experimental control of therapist style (cf. Patterson and Forgatch 1985).

It may be that such angry reciprocation by therapists to hostile clients is suppressed by training in MET. Peterson and colleagues (1997) conducted a sequential analysis of therapist and client behaviors during the various phases of MET sessions in Project MATCH. Only MET processes and outcomes were examined, and no comparisons were made with other

therapy approaches. We were interested, among other things, in studying client behaviors that followed therapist confrontation responses, expecting to see an increase in resistance. It is noteworthy, in reference to current findings, that not a single "angry" or confrontational response was found in videotapes from 22 different MET therapists participating in the trial. This suggests that MET therapists were indeed not reciprocating clients' negative behaviors, which could account for better outcomes for angry clients in the MET condition. A full testing of this relationship will require more extensive examination of videotapes from all three treatment conditions.

Alternatively, angry clients may be more reactive to therapists' attempts to structure their behavior. In accord with the theory of reactance, Brehm (1972) maintained that clients will behave in ways that preserve their personal freedom, even if doing so is countertherapeutic. Traditional behavioral treatment models characterize the therapist role as a teacher or guide. Cognitive-behavioral coping skills interventions targeting client anger typically specify the content and sequencing of therapist techniques to be presented to clients. Providing choices to clients and leading clients to draw therapeutically sound conclusions on their own (e.g., through Socratic methods) may be more effective (Newman 1994). In one study, Deffenbacher et al. (1994) suggested that a more inductive, client-focused approach to skills training in which strategies for anger management are elicited from the clients and not imposed on them would be more effective in lowering resistance and improving outcome. They found that the inductive application of skills training was significantly more effective than standard skills training approaches in reducing daily anger. MET specifically emphasizes personal freedom of choice and prescribes strategies that elicit self-directing responses from client.

In the MET model, motivation and resistance are viewed as products of the interaction between client and therapist (Miller 1983). Similarly, Kiesler (1982) argued that the therapeutic relationship derives from reciprocal exchanges between therapists and clients. According to Kiesler, the evoking style (e.g., anger) that some

clients bring to therapy and the manner in which therapists respond to them likely reflects an important aspect of the therapeutic relationship. Examining therapy interactions in microanalytic detail, then, may provide a more fruitful strategy for understanding the dynamic relationship that develops between angry clients seeking treatment for alcohol problems and MET therapists, offering clues to how that relationship influences treatment outcome. Well-developed microanalytic therapy coding systems (e.g., Chamberlain et al. 1986; Pinsof, 1980) could be used to compare the patterns of therapist behaviors and cooperative and resistant responses of clients across the three treatment conditions. Such an examination may illuminate the actual causal chain underlying the matching results found in this study.

Also worthy of further attention is the unanticipated finding that clients low in anger fared better in CBT and TSF than in MET, reflected in the disordinal rather than ordinal matching interaction. One possibility is a mismatch of MET (originally designed for clients less ready for change) with clients who are less angry and resistant and are already more motivated for change. Such clients may be ready for and prefer the more structured change strategies of CBT or TSF.

Functional family therapy (FFT), which is one therapeutic model used to treat families with drug and alcohol problems, integrates both motivational and behavior change strategies in dealing with substance use problems in families (Alexander and Parsons 1982). The impact of FFT depends in part on the specific techniques prescribed, but perhaps even more so on the particular sequencing or timing of the techniques across sessions, with readiness for change as the focus of earlier sessions and behavior change strategies implemented in later sessions, after motivational and assessment tasks have been completed. According to the model, attempting to institute behavioral changes with unmotivated families will evoke resistance, but with enhanced motivation, families can move more quickly into the behavior change phase (Waldron and Slesnick 1998). Motivational interviewing has been used effectively as an add-on component to other

treatment models (Bien et al. 1993; Brown and Miller 1993). Combining MET with other, more structured approaches for clients with alcohol problems, taking into account client anger and readiness for structured interventions, might allow therapists to tailor the treatment to clients' stage of readiness and provide for the most optimal treatment match.

Also unexplained is the strong matching effect among outpatients, but no matching effect among aftercare clients. Both received outpatient treatment in Project MATCH, the difference being that aftercare clients had recently completed a week or more of inpatient or day hospital treatment. The causal chain analyses reported above did not reveal significant process differences that would account for a matching effect in only one arm of the study. Microanalyses of session videotapes again may prove more revealing.

Finally, it should be noted that client anger was measured in a somewhat limited way for present analyses. Using the STAX, we were able to find support for differential treatment outcomes, but a more comprehensive measure including other aspects of anger such as indices separating frequency, intensity, and appropriateness of angry feelings may provide additional information in understanding and addressing anger in treatment and in helping to elucidate the specific aspects of an anger-prone person's anger experiences. A more refined behavioral measure might produce clearer findings. Certainly, client resistance behaviors coded from therapy sessions have proved useful in predicting treatment outcomes (e.g., Miller et al. 1993).

Acknowledgments

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Prospects for Matching Clients to Alcoholism Treatments Based on Conceptual Level

John P. Allen, Ph.D.

ABSTRACT

Conceptual level refers to a broad experiential style of relating to one's environment. Individuals low in the dimension tend to think in rather concrete ways and often conceptualize issues as dichotomous rather than as complex and multidimensional. Previous research has suggested that alcoholics low in conceptual level tend to do better with more structured interventions. In Project MATCH, it was hypothesized that lower conceptual level patients would derive greater reduction in frequency and intensity of drinking if assigned to Twelve Step Facilitation and that higher conceptual level subjects would fare better with Motivational Enhancement Therapy. This matching hypothesis was not confirmed, but, to at least some extent, this may have been due to very poor reliability in the measure of conceptual level chosen.

Conceptual level (CL) refers to a consistent, pervasive cognitive and motivational style of relating to one's environment. CL is measured as a continuous variable ranging from cognitive simplicity (i.e., a proclivity to view situations and issues as concrete "black-white" dichotomies) to cognitive complexity (i.e., a sensitivity to subtle nuances and a tendency to abstract about situations and see issues from multiple perspectives).

Individuals low in CL are believed to learn and function most effectively in an environment which structures their experiences for them. High CL individuals, however, are assumed to do best in a nondirective, unstructured environment which allows them maximal freedom to make decisions for themselves. Conversely, low CL individuals would be predicted to be confused and threatened in environments stressing self-direction and judgment.

Two lines of research suggest that matching based on congruence of CL of clients with certain aspects of treatment may improve outcome. Most relevant is McLachlan's (1972) work dealing specifically with alcoholics. General research on psychotherapy and educational interventions also suggests that CL relates to choice of interventions differing in degree of structure.

Previous Research

McLachlan (1972) studied 92 alcoholic inpatients at the Donwood Institute in Toronto, Canada. The sample appears to have been reasonably high in social stability as reflected by the fact that most were currently married, the mean educational level was 12.7 years, and they were being treated in a private facility. While

John P. Allen, Ph.D., MPA
Associate Director of Treatment Studies (DCPR)
National Institute on Alcohol Abuse and
  Alcoholism
Willco Building, Suite 505
6000 Executive Blvd., MSC 7003
Bethesda, Maryland 20892-7003
E-mail: jallen@willco.niaaa.nih.gov

information on severity of dependence was not reported, only about one-third had received prior treatment for an addiction problem. Clients with "known" brain damage and those with severe physical or emotional problems such as to render them inappropriate for group therapy were excluded from the study.

Prior to initiation of therapy, clients were administered the Paragraph Completion Method (PCM; Hunt et al. 1978) and a verbal intelligence measure. Five group therapists also completed the PCM. Interrater reliability of the clients' CL thus measured was 0.93 with an internal consistency coefficient of 0.82. (Reliabilities for staff members' CL were not reported.) Fifty-three clients were classified as low CL (i.e., PCM score <1.5). Using higher cut points, two therapists were classified as low CL and three as high CL. Nurses in consort also ranked therapists on nondirectiveness in treatment. A Spearman's rho of 0.90 was reported between degree of nondirectiveness and CL for therapists.

The treatment program is briefly summarized in the report as 26 hours of group psychotherapy conducted over 3 weeks. The overall intervention strategy was identified as reconstructive, client-centered, and involving frequent use of psychodrama. The stated goals of therapy were to help clients cope with problems contributing to their dependency on alcohol, to enhance self-confidence, and to improve interpersonal skills.

Outcome measures on eight therapy rating scales were obtained from clients. The group therapist and group nurse also rated each client on overall improvement by using a 6-point ordinal scale from "worsened" to "complete alleviation of presenting problem." Nurses and therapists also evaluated clients on improvement in functioning in group therapy and outside the hospital. Further, at least one family member was interviewed to assess client functioning outside of the hospital.

Outcome was gauged by the client's score on the first varimax-rotated factor derived from the correlational matrix of ratings by clients, nurses, and therapists. This factor was labeled "Client-Rated Improvement" and was loaded primarily by items dealing with the client's estimate of global benefit from group therapy,

including the item dealing with changes in "complaint or symptoms that brought you for treatment." Note that the study did not directly ask about changes in drinking status.

The primary statistical analysis was a 2×2 analysis of covariance. CL of therapist and client served as independent variables, verbal IQ as a covariate, and standardized score on the client improvement factor as the dependent variable. The main effects were not significant. However, the client-therapist CL interaction effect was highly significant ($p<.005$), indicating that matched clients rated their improvement as higher than did those mismatched to therapists.

McLachlan (1974) provided 12- to 16-month followup data on these clients and, further, examined the impact of two different venues for providing aftercare as they interact with client CL.

The two types of aftercare were:

- Weekly meetings and weekly phone calls for the first year following inpatient treatment.

- Letters to clients encouraging them to write to another client who was a member of the inpatient therapy group.

Drinking data were available for 87 of the original 92 clients. Seven additional clients missing posttreatment data in the 1972 study were added. Outcomes were classified according to a 4-point ordinal scale from "no improvement" to "fully abstinent since treatment." Informants for determining followup status were clinic secretaries (who also played a role in treatment), a counselor, a physician, and fellow clients who had maintained contact with the client since discharge. When ratings were inconsistent across sources, the lower rating was selected for purposes of the outcome evaluation.

Urban clients received the first type of aftercare described and out-of-town clients received the second, "low structure," type of aftercare. Clients were distinguished as matched or mismatched based on their CL being high or low and their treatment being high or low in structure. Outcomes were dichotomized by combining no improvement and some improvement

categories (39 percent of clients) and much improvement and fully abstinent categories (61 percent of clients).

Analyses focused on how matching to inpatient group therapist related to outcome and how matching to the two types of aftercare related to outcome. Both types of matching were associated with about the same rate of recovery (70 percent) and both kinds of mismatching with about the same rate of recovery (50 percent). Seventy-seven percent of the "doubly matched" clients had favorable outcomes but only 38 percent of the "doubly mismatched" clients were judged as recovered.

Beyond McLachlan's work specifically on alcoholics, the topic of matching clients to psychological treatments and students to educational interventions has proven quite popular, and a comprehensive review of these studies has been prepared by Stoppard and Miller (1985). Due to the number of such studies, only some of the general conclusions are offered:

- Most research has dealt with "contemporaneous" matching (i.e., matching of clients with treatments based on the client's current CL) rather than "developmental" matching (i.e., trying to enhance the clients' CL by placing them in a setting slightly above that appropriate to their current CL).

- Client satisfaction or reported comfort is a common outcome measure for such studies since CL theory posits that therapeutic rapport and empathy are strengthened when clients are assigned to interventions based on CL. A small number of studies (e.g., McLachlan's), however, have looked at the effect of matching on resolution of client problems.

- With the exception of McLachlan's (1972) study, degree of formal intervention structure has served as the treatment variable.

- Only 20 percent of the reviewed studies failed to discover a matching effect. Also, only one study discovered a matching effect *inconsistent* with CL theory, and this study was rather poorly controlled.

- Research on CL far more typically reveals interaction effects than main effects.

- Most matching studies have revealed ordinal effects, with low CL clients responding better when matched to condition. High CL individuals seem less affected by differences in treatment structure.

The Matching Hypotheses

Clients higher in CL will have a higher percentage of days abstinent when treated by Motivational Enhancement Therapy (MET; Miller et al. 1992) than by Twelve Step Facilitation (TSF; Nowinski et al. 1992). Conversely, clients lower in CL will do better in this regard when treated by TSF.

Clients higher in CL will consume more alcohol on the days in which they do drink when treated by TSF than when treated in MET. Conversely, clients lower in CL will do better in TSF.

The hypothesized interaction effect is portrayed in figure 1.
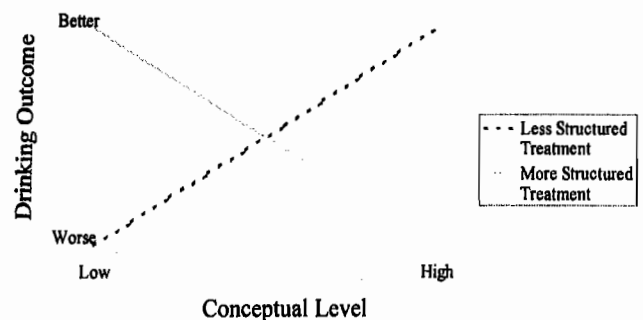
Figure 1. Hypothesized matching effect for conceptual level.

Measurement

CL in Project MATCH was measured using the PCM. The test consists of seven brief stems alluding to basic life themes such as parent roles. Clients are asked to complete each stem by writing at least three sentences describing their reactions. Guidelines in the manual (Hunt

et al. 1978) provide general principles for scoring responses according to degree of CL demonstrated. The manual also offers numerous examples of various level CL responses for each stem. The client's score is the average of the highest three responses.

Psychometric properties of the PCM were computed using as a subject pool the first 40 clients from each of 8 research sites and 38 from the ninth. The observed frequency distribution was generally normal, with skewness and kurtosis of only –0.34 and 0.29, respectively. Although only nine clients failed to attempt the PCM, nearly 16 percent of the item responses were unscorable due to paucity of content.

Interrater reliability, split-half reliability, and coefficient alpha based on 103 response protocols were 0.73, 0.41, and 0.49, respectively. Factor analysis revealed that the first unrotated principal component accounted for 35 percent of the total variance and, with the exception of a single item, all items loaded at at least 0.55. The parents item correlated at only 0.13 with the first principal component score.

Results

The hypothesized model predicted that the interaction of type of treatment (TSF versus MET) and conceptual level of the client would be significantly related to drinking outcome. Figure 2 schematizes the relationship actually observed on the outcome variable percentage of days abstinent. Above and below the line respectively are the p-values for the outpatient
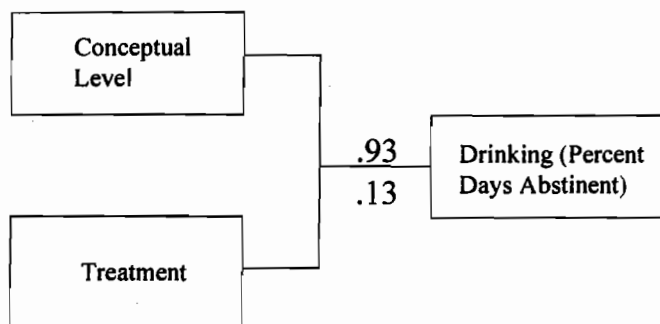

Figure 2. P-values of relationships of CL and treatment to drinking outcome.

arm and the aftercare arm of MATCH. Neither is statistically significant.

At least three reasons seem possible for the failure to demonstrate the predicted effect. Obviously, there may, in fact, be no relationship in nature between the variables, despite the earlier findings reported by McLachlan (1972, 1974) and the generally positive findings noted by Stoppard and Miller (1985) in the educational literature. (A recently reported study (Nielsen et al. 1998) has also found that matching alcoholic outpatients to degree of treatment structure was associated with treatment retention. Unlike in MATCH, however, this investigation did not deal with drinking outcomes per se.)

The second possibility lies with difficulties in scoring the PCM. In our hands, the interrater reliability of the measure was only 0.73, despite a 1-week training course given to the raters. Factor analysis of the PCM as well as coefficient alpha also suggested that the content of the PCM is heterogeneous.

Thirdly, it was assumed that TSF would be more structured than MET. This was only demonstrated in the outpatient arm of the trial. Nevertheless, the relationship of degree of structure of treatment and conceptual level to drinking was not significant in either arm of the study.

Future research on the relationship of conceptual level of the client and degree of alcoholism treatment structure might more profitably employ an alternative measure to the PCM as well as contrast treatments differing in structure more extremely than the interventions in Project MATCH. Interventions might also be assessed against other relevant, but nondrinking, outcomes such as treatment retention and client satisfaction.

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The Search for Meaning in Life as a Predictor of Alcoholism Treatment Outcome

*J. Scott Tonigan, Ph.D., William R. Miller, Ph.D., and
Gerard J. Connors, Ph.D.*

ABSTRACT

The core literature of Alcoholics Anonymous (AA) identifies two prerequisites for suc-
cessful affiliation and positive outcome within AA. These are a sense of "hitting bottom"
and a willingness to accept and practice a spiritual program for recovery. This chapter
presents the rationale and operational definition for client *meaning-seeking*, a composite
measure intended to represent these characteristics. A prospective matching hypothesis
was developed in Project MATCH which stated that meaning-seeking and posttreatment
percentage of days abstinent would be positively and strongly related within the Twelve
Step Facilitation (TSF) condition, whereas a weaker positive relationship would be
found in the combined Cognitive-Behavioral Coping Skills (CBT) and Motivational En-
hancement (MET) therapies. Similarly, client meaning-seeking and drinking intensity
were predicted to be weakly related within the combined CBT and MET conditions, but
strongly and negatively related for clients assigned to TSF. Partial support for the pro-
spective matching hypothesis was found in the aftercare sample, but not in the outpa-
tient sample. Proposed causal mechanisms underlying the hypothesis were partially
supported in the outpatient sample, and adjustments to the causal model led to partial
support of the prospective model in the aftercare sample.

Involvement in Alcoholics Anonymous (AA)
is widely recommended as an aid in recov-
ery. Meta-analytic reviews indicate that
such engagement is associated with more favor-
able outcomes (Emrick et al. 1993) and that the
magnitude of benefit may vary according to
whether clients received prior outpatient or in-
patient treatment (Tonigan, Toscova et al.
1996). Substantial effort has been directed to-
ward the identification of predictors of AA affili-
ation, with at least 62 client characteristics ex-
amined in one or more studies. Client attributes
most associated with AA affiliation include
heavier drinking, more severe alcohol depend-
ence, and experienced loss of control when
drinking (Emrick et al. 1993).

Nevertheless, even the strongest predictors of
AA affiliation account separately for less than
10 percent of the variance in AA attendance and
involvement, indicating that currently identi-
fied predictors are of limited clinical utility in
identifying whom to refer or not to refer to AA.
Predictor variables appear to have been se-
lected most often on the basis of convenience
(what can be measured easily) rather than what
ought to be measured from a conceptual analy-
sis of AA. We believe that the core literature of

J. Scott Tonigan, Ph.D.
Center on Alcoholism, Substance Abuse and
    Addictions (CASAA)
2350 Alamo SE
The University of New Mexico
Albuquerque, NM 87131
jtonigan@unm.edu

AA offers some clear predictions of the likely characteristics of AA affiliates, many of which have been ignored in alcohol research.

This chapter describes the rationale and development of one composite variable to predict AA affiliation and involvement for clients assigned to a formal Twelve Step Facilitation (TSF; Nowinski et al. 1992) therapy. The composite variable was derived from a theoretical perspective, combining recommendations made in the core AA literature with findings from AA research. The predictive utility of this composite variable was examined prospectively with the Project MATCH (1993, 1997) clinical samples, the results of which are presented here along with an evaluation of the conceptual causal chain underlying predicted relationships.

Rationale of the Client Matching Variable

The central question underlying this investigation was, "Who will be most likely to affiliate with and derive benefit from AA?" According to the basic "big book" of AA (1976), "hitting bottom" is essential. This bottoming out, as understood in AA, is characterized not so much by catastrophic consequences as by a spiritual/existential bankruptcy and a sense of hopelessness about one's ability to control drinking despite awareness of its consequences. The big book describes hitting bottom as a period of "incomprehensible demoralization" that is necessary but not sufficient for recovery. Also needed, by AA's account, is a *willingness* to accept help and to pursue a spiritual path to recovery. This distinction is reflected both in the common statement in meetings that "AA is not for everybody who needs it, but for those who need it *and* want it," and in advice for working with an alcoholic (Alcoholics Anonymous 1976):

> If he is not interested in your solution, if he expects you to act only as a banker for his financial difficulties or a nurse for his sprees, you may have to drop him until he changes his mind. (p. 95) . . . We find it a waste of time to keep chasing a man who cannot or will not work with you. (p. 96)

Typical research measures of motivation for change do not really capture this concept of hitting bottom. While change readiness is tacitly present in AA's third tradition and in the AA program's emphasis upon "one day at a time" (McCrady 1994), an AA understanding of this critical willingness refers more to a critical desire for meaning in life that is found through spiritual means.

Meaning-Seeking as a Composite Matching Variable

There are two potentially distinct aspects of this spiritual/meaning crisis. One aspect is an experienced *lack of meaning in life*. Crumbaugh and Maholick's (1976) Purpose in Life (PIL) scale was designed specifically to assess current sense of meaning, and it has been used in prior studies of substance abuse (Black 1991). On the PIL, lower scores reflect a relative lack of perceived current life meaning. Such meaning deficit is, we believe, a better operationalization of hitting bottom, as understood in the core AA literature, than are measures of drinking patterns, consequences, or dependence levels. Yet a meaning void alone does not capture the AA element of willingness. A second Crumbaugh (1977) instrument, the Seeking of Noetic Goals (SONG) scale, was developed as a companion measure to the PIL and was designed to assess the extent of *desire for and seeking* of greater meaning in life. Higher scores on the SONG reflect a quest for greater meaning.

Because both elements seem essential to capture AA's understanding of hitting bottom, we reasoned that a difference score (SONG minus PIL) would be a reasonable operational definition. High positive values on this meaning-seeking difference score reflect a low sense of current meaning combined with a strong desire for greater meaning. Negative meaning-seeking values, on the other hand, suggest that current sense of purpose exceeds the desire for greater meaning in life. This difference score can range from +120 (maximum SONG score of 140, minimum PIL score of 20) to -120 (minimum SONG score of 20, maximum PIL score of 140). In this way, meaning-seeking can be conceived as a point along a continuum between these extremes.

Predicted Relationships

A primary matching hypothesis in Project MATCH (1993, 1997) was that higher scores on meaning-seeking (hitting bottom) would predict better outcomes in the TSF treatment, which explicitly focuses on issues of spirituality and meaning (Nowinski et al. 1992). Consistent with core AA writings, we also expected that lower meaning-seeking scores, reflecting distance from hitting bottom, would be associated with poorer outcomes in TSF. This, then, illustrates a testable hypothesis derived directly from AA theory:

In terms of the two primary outcome measures chosen for Project MATCH, we predicted that meaning-seeking and posttreatment percentage of days abstinent (PDA) would be strongly and positively related for clients assigned to TSF, and that meaning-seeking and posttreatment drinks per drinking day (DDD) would be strongly and negatively related for clients assigned to TSF.

We had no reason to predict a relationship between meaning-seeking and outcomes for clients assigned to the other two treatments studied in Project MATCH: Motivational Enhancement Therapy (MET; Miller et al. 1992) and Cognitive-Behavior Coping Skills Therapy (CBT; Kadden et al. 1992). Consequently, we pooled clients in these conditions into a single group and made the prediction that meaning-seeking would be modestly related to outcomes (PDA and DDD) for these non-TSF clients.

An important contribution of the Project MATCH analytic strategy is the requirement that prospective hypotheses delineate and statistically test the causal mechanisms supporting the hypothesis. Our meaning-seeking predictions were based upon the assumptions that the content of the TSF modality would be more relevant to higher meaning-seeking clients and, consequently, meaning-seeking would be more positively related with satisfaction with treatment within the TSF condition than in the combined MET and CBT conditions. In turn, meaning-seeking and two measures of treatment compliance within TSF (AA meeting attendance and percentage of therapy sessions attended) would be more positively related in TSF than in the combined CBT and MET conditions. Finally, we expected that these mechanisms would become manifest in a more positive relationship between meaning-seeking and attendance and involvement in AA both during and after treatment for clients assigned to TSF and that higher AA involvement would predict (and maintain) better outcome (higher PDA and lower DDD).

Results

Of the 1,726 clients studied in Project MATCH, 96 percent provided sufficiently complete data at intake to compute the composite meaning-seeking matching variable. No mean differences were found among the three treatment groups in either the outpatient ($F(2, 914)=$ 0.14, $p<.87$) or the aftercare ($F(2, 737)=0.09$, $p<.92$) arms of the study, although clients' mean levels of meaning-seeking did vary significantly within both outpatient sites ($F(4, 910)=3.13$, $p<.014$) and aftercare sites ($F(5, 734)=4.7$, $p<.0003$). A reasonably normal distribution was obtained within each arm for the composite variable (outpatient: $M=-16.50$, $SD=29.09$, skewness=0.17; aftercare: $M=-10.90$, $SD=$ 30.21, skewness=0.27).

Outpatient Sample

Prognostic Effect of Meaning-Seeking

The prognostic effect of baseline meaning-seeking was examined separately for outpatient and aftercare clients. These analyses were run separately for the treatment period (months 1–3) and for the followup period (months 4–15). Prognostic effects for the primary dependent measures (PDA and DDD) were examined in a hierarchical linear modeling (HLM) context which controlled for site, treatment, and time (linear and quadratic terms) and their interactions with each other and the meaning-seeking attribute (Project MATCH Research Group 1997; Longabaugh and Wirtz, this volume, pp. 4–17).

Baseline meaning-seeking was not predictive of abstinence (PDA) during the 12 weeks of treatment in the outpatient ($p<.17$) sample.

Likewise, no prognostic effect was observed for PDA during the 12 months of followup in the outpatient ($p<.27$) sample. This finding was consistent across sites, evidenced most clearly in the nonsignificant site by meaning-seeking product terms in the HLM tests (all p's $>.30$). In contrast, at intake, meaning-seeking did predict drinking *intensity* (DDD) during outpatient treatment ($p<.04$), a finding that was relatively consistent across sites (site by meaning-seeking interaction, $p<.39$). Examination of scatter plots indicated that outpatient clients higher in meaning-seeking reported more DDD during treatment, relative to outpatients with lower baseline meaning-seeking scores. The prognostic effect between meaning-seeking and DDD faded during followup (months 4–15) in the outpatient sample ($p<.78$), and little variation in this finding was identified when the matching attribute was crossed by site or treatment condition.

Testing of the Primary Matching Hypothesis

The rationale for testing of the prospective Project MATCH primary hypotheses and protection of type 1 error rate has been described elsewhere (Project MATCH Research Group 1993, 1997; Longabaugh and Wirtz, this volume, pp. 4–17) and will not be repeated in detail. Essentially, 24 HLM tests specifically examined the meaning-seeking hypothesis, 12 conducted from data during treatment and 12 with followup data. The 12 parallel HLM tests included: (1) four tests of the matching hypothesis collapsing time, separately for PDA and for DDD, with aftercare and outpatient samples, (2) the same four tests of the matching hypothesis as it potentially changed in magnitude across time in a linear function, and (3) the same series of four tests of the matching hypothesis as it potentially changed in magnitude across time in a quadratic function.

Figure 1 shows the mean monthly transformed PDA values by the dichotomized meaning-seeking attribute (low: 0 or negative score, high: $\geq+1$) for outpatients in the TSF condition and in the combined CBT and MET conditions. Consistent with our

predictions, high meaning-seeking clients assigned to TSF reported a higher frequency of abstinent days than did low meaning-seeking TSF clients. Twelve months after treatment, for example, high meaning-seeking clients assigned to the TSF condition reported, on average, 7 percent more abstinent days relative to low meaning-seeking clients assigned to the TSF group. Contrary to expectations, however, this same trend—albeit a smaller, 2-percent difference in abstinent days 12 months after treatment—was found in the non-TSF groups, although as reported earlier, the overall prognostic relationship was not statistically significant.

Table 1 provides the probability values associated with the results of the overall and time-bound matching tests of the meaning-seeking attribute for the within-treatment and post-treatment periods for both primary dependent measures. None of the planned tests ($n=12$) was significant, and only modest variation in matching results was found across outpatient sites.

Also reported in table 1 are the unplanned pairwise matching contrasts for the meaning-seeking attribute. None of these 36 post hoc contrasts supported the matching hypothesis. Thus, for outpatients, we found no support for the prospective and post hoc hypothesis predicting a differential treatment response in frequency and intensity of drinking between TSF and the combined CBT and MET groups on the basis of the meaning-seeking attribute.
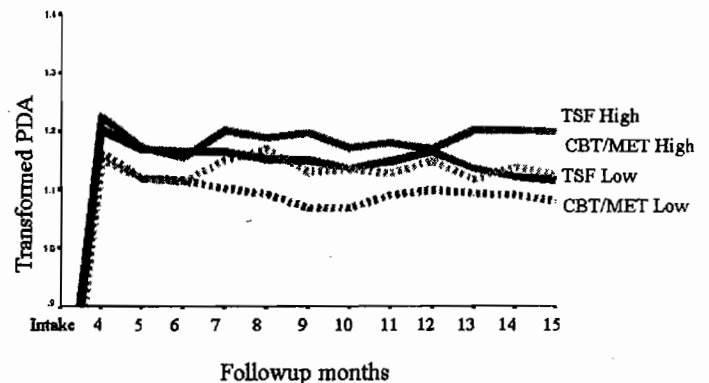

Figure 1. Comparison of high versus low meaning-seeking outpatient clients assigned to TSF and combined CBT and MET. (Percentage of days abstinent for the 12 months after treatment completion.)

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Table 1. Summary of a priori and post hoc meaning-seeking matching tests: Outpatient sample (N= 952) (probability values)

	Planned contrast	Unplanned contrasts		
	TSF vs. CBT+MET	TSF vs. CBT	TSF vs. MET	CBT vs. MET
During treatment				
Percentage of days abstinent	.85 (.87)[1]	.59	.83	.47
Percentage of days abstinent$_{Linear}$	.60 (.54)	.81	.51	.69
Percentage of days abstinent$_{Quadratic}$	.78 (.94)	.82	.49	.38
Drinks per drinking day	.90 (.86)	.62	.78	.46
Drinks per drinking day$_{Linear}$	.75 (.82)	.62	.96	.67
Drinks per drinking day$_{Quadratic}$	.99 (.89)	.87	.87	.75
Posttreatment: Months 4–15				
Percentage of days abstinent	.32 (.43)[1]	.51	.30	.70
Percentage of days abstinent$_{Linear}$	.90 (.79)	.72	.57	.38
Percentage of days abstinent$_{Quadratic}$	.13 (.11)	.12	.30	.63
Drinks per drinking day	.27 (.46)	.55	.51	.95
Drinks per drinking day$_{Linear}$	.54 (.70)	.77	.71	.93
Drinks per drinking day$_{Quadratic}$	.22 (.21)	.12	.56	.35

[1] Probability values not controlling for site × treatment × matching attribute interaction are in parentheses.

Causal Chain Analyses

The hypothesis predicted that high meaning-seeking clients would feel more comfortable, and be more receptive to, the content of the TSF modality relative to low meaning-seeking clients. This positive response of higher meaning-seeking clients in TSF was predicted to be manifest in greater satisfaction with therapy, higher AA attendance and therapy compliance, and more involvement in AA. Higher involvement in AA was, in turn, expected to lead to more positive outcomes. Client meaning-seeking was expected to be unrelated to the content and processes of the CBT and MET conditions.

Several analytic strategies were used to test the adequacy of the meaning-seeking causal chain. Structural equation modeling (Byrne 1994) was initially chosen to test underlying assumptions of the model, but deletion of cases because of missing process data reduced the outpatient sample by 29 percent and the aftercare sample by 33 percent. The approach eventually adopted was hierarchical multiple regression analyses which, after controlling for site,

matching attribute, and treatment main effects, tested the matching attribute by treatment product term (i.e., meaning-seeking by TSF versus CBT+MET combined). In this analysis, rejection of the null hypothesis for the product term would indicate a differential relationship between meaning-seeking and the criterion measure (a variable in our causal model) by the specified treatment contrast. Unstandardized and standardized beta weights were examined to assess the nature of any observed differential relationship between meaning-seeking and a causal variable nested within treatment conditions.

Table 2 summarizes the causal chain analyses for the outpatient sample. Complete support for the prospective model would result in p values <.05 under the column heading Interaction, indicating a different relationship (by treatment condition) between meaning-seeking and listed causal variables. Complete support for the model would then have large and positive beta weights for TSF and nonsignificant beta weights for CBT+MET.

Table 2. Summary of causal chain analyses for outpatient sample (N=952)

Causal (criterion) variable	Interaction	TSF	CBT+ MET
Therapy process			
Client Satisfaction With Treatment	p<.067	.03	.15
WAI: Relationship Bond	p<.051	.04	-.10
WAI: Goal Compatibility	**p<.021**	-.01	-.18
WAI: Task Compatibility	**p<.003**	-.02	-.14
Percent Therapy Sessions Attended	p<.231	-.11	-.10
AA attendance			
Months 1–3	**p<.015**	.13	.04
Months 4–6	**p<.041**	.14	.09
Months 6–9	p<.160	.09	.03
AA involvement			
Months 1–3	p<.961	.12	.16
Months 4–9	p<.870	.09	.10

NOTE: WAI refers to client ratings of the therapeutic relationship (at Week 2 of treatment) using the Working Alliance Inventory (Horvath and Greenberg 1986). Unstandardized β weights.

As shown, findings were mixed in their support of the proposed causal chain. Client meaning-seeking was unrelated to client report of goal compatibility and task compatibility in the TSF condition and was negatively related with report of goal compatibility and task compatibility in the combined CBT and MET conditions. Trends for client satisfaction with treatment and bond with the therapist similarly reflected a negative relationship with meaning-seeking in the CBT+MET condition but not for TSF clients. It appears, therefore, that high meaning-seeking clients found the goals and tasks of TSF less unacceptable than those of the CBT and MET clients combined.

A core assumption was supported by the finding that meaning-seeking predicted AA affiliation in the TSF group but not in the CBT and MET groups. Regression analyses for AA attendance excluded outliers (AA values exceeding 3 SD from treatment group mean), although findings did not substantially differ when outlier

cases were retained in the analyses. Both during treatment (months 1–3) and for the 3 months immediately following treatment (months 4–6), meaning-seeking was positively and significantly predictive of AA meeting attendance for TSF clients, and meaning-seeking was marginally related to AA attendance in the CBT and MET groups. The predicted relationship was not observed for our measure of AA involvement (Tonigan, Connors et al. 1996).

Figure 2 demonstrates a clear and consistent ranking across 39 months of followup of a trichotomized meaning-seeking variable and percentage of days AA attendance as predicted for TSF clients. Mean values of the meaning-seeking variable were highest for the high meaning-seekers, followed by the medium and low meaning-seekers (at all followups), and post hoc scheffe tests indicated that these differences were significant at 3 ($p<.006$), 12 ($p<.041$), and 15 ($p<.016$) months followup.
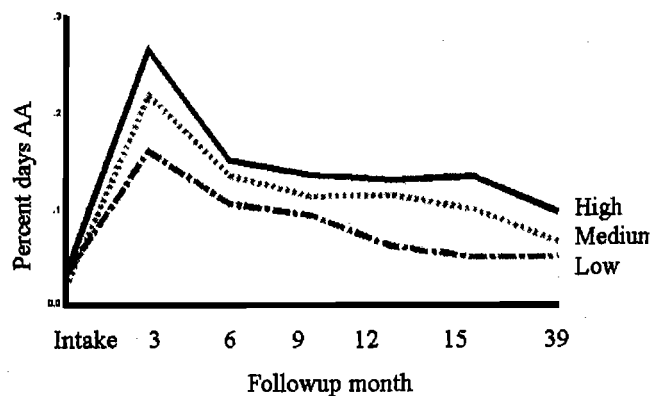

Figure 2. Trichotomized meaning-seeking attribute for TSF outpatient clients.

Did the positive association between meaning-seeking and AA attendance for outpatient TSF clients become manifest in positive outcome? Two hierarchical multiple regression analyses were conducted to examine this question, with summary measures of frequency (PDA) and intensity (DDD) of drinking (months 4–9) separately serving as criterion measures. Site, baseline drinking (PDA and DDD), treatment, and meaning-seeking main effects were entered first, followed by main effect of percentage of days AA attendance and, in the third

block, the product term representing percentage of days AA by the a priori treatment contrast (TSF versus CBT+MET).

The product term with PDA at proximal followup as the dependent measure (months 4–9) was not significant ($p<.13$), indicating no differential relationship between AA attendance and frequency of abstinent days by treatment condition (TSF vs. CBT+MET). The main effect of AA, after controlling for site, treatment, baseline drinking, and meaning-seeking main effects was significant ($p<.0001$) and accounted for 4 percent of variance in frequency of drinking for the first 6 months after the end of treatment. The slope associated with the AA predictor ($b=0.44$, $t(844)=6.28$) was positive, indicating that higher rates of AA attendance during treatment were predictive of higher frequency of abstinent days during followup.

With drinking intensity as the dependent measure, a significant differential relationship was obtained between percentage of days AA attendance during treatment and drinking intensity (months 4–9) by treatment condition (TSF versus CBT+MET), $t(843)=2.14$, $p<.03$. Inspection of DDD regressed on percentage of days AA indicated that, within TSF, DDD was negatively and significantly related with AA attendance ($b=-1.68$, $p<.001$), and that AA attendance and drinking intensity were not related in the combined CBT and MET conditions ($b=-0.80$, $p<.06$). These findings are consistent with the prospective model described above.

Aftercare Sample

Prognostic Effect of Meaning-Seeking

Prognostic effects of the meaning-seeking variable on PDA and DDD were examined during treatment and for the 12 months after treatment. These effects were studied in the context of HLM and, like the analyses for the outpatient sample, these analyses controlled for variation accounted for by site, treatment, and matching attribute main effects and their interactions. Baseline meaning-seeking was not predictive of PDA either during treatment ($p<.19$) or for the 12 months after treatment ($p<.11$) in the aftercare sample. This finding was consistent across

the aftercare sites as indicated by the nonsignificant site by meaning-seeking interaction terms. Unlike the outpatient sample, meaning-seeking and drinking intensity were statistically unrelated in the aftercare sample during treatment ($p<.06$) and remained at the trend level of a relationship during the 12 months after treatment ($p<.06$). Little variation across aftercare sites was identified in regard to this trend finding.

Testing of the Primary Matching Hypothesis

Statistical tests of the meaning-seeking hypothesis in the aftercare sample were parallel to the tests conducted in the outpatient sample. Twenty-four tests were conducted; 12 of these focused on the treatment phase of the study, and 12 tests examined the matching hypothesis during the 12 months after treatment.

Figure 3 shows the monthly transformed PDA outcomes for high versus low meaning-seeking aftercare clients in TSF and in the combined non-TSF conditions (low: 0 or negative score, high: ≥ 1). In the aftercare TSF condition, high meaning-seeking clients fared somewhat less well during early followup (10 percent fewer abstinent days in month 4, $p<.03$), but this pattern reversed into the predicted direction during later months. Contrary to our prediction that meaning-seeking would be less related to PDA in the non-TSF conditions, low meaning-seeking clients consistently fared better than did high meaning-seeking clients
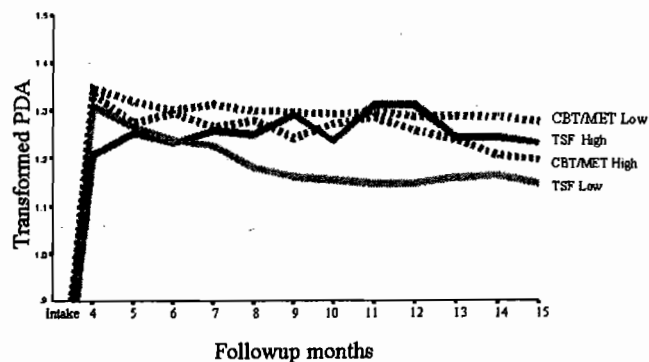
Figure 3. Comparison of high-low meaning-seeking aftercare clients assigned to TSF and combined CBT and MET. (Percentage of days abstinent 12 months after treatment.)

throughout the followup period. Differences in PDA outcome between high and low meaning-seeking in the non-TSF conditions were significant for followup months 7–15, with the largest monthly difference representing 10-percent fewer abstinent days for high meaning-seeking clients.

Table 3 gives the probability values associated with the 12 matching tests of the meaning-seeking hypothesis in the aftercare sample. No support was found for the hypothesis during the treatment phase of the study on either PDA or DDD. A significant attribute by treatment (TSF versus CBT+MET) by time$_{Linear}$ interaction was found, however, on the PDA measure for followup months 4–15. This nondirectional interaction test was significant after Bonferroni correction for type 1 error, indicating that the magnitude of the difference in slopes for the specified treatment contrast varied across time. Monthly followup tests were conducted to ascertain if the change in slopes across time was in the predicted direction, and this was partially confirmed. In this regard, monthly contrasts for

months 5 through 14 were $p<.05$, with only baseline drinking covaried; monthly contrasts for months 11, 12, and 13 were $p<.10$ when adjusted for baseline drinking, site, and site by time effects. No support was found for the predicted meaning-seeking hypothesis using the DDD primary outcome measure during the 12 months of followup. Inspection of directional monthly contrasts suggested that the absence of a differential treatment response between meaning-seeking and drinking intensity was consistent across time, and little variation was observed between meaning-seeking and drinking intensity when crossed by site and time.

Table 3 also gives the results of 36 unplanned pairwise contrasts of the matching hypothesis. As shown, two contrasts, both for PDA$_{Linear}$ months 4–15, were significant. These contrasts involved separately testing CBT and MET against TSF and indicate that the planned contrast that was significant (TSF versus CBT+MET, PDA$_{Linear}$ months 4–15) was not the result of either CBT or MET "pulling" the combined outcome for these groups in a particular

Table 3. Summary of a priori and post hoc meaning-seeking matching tests: Aftercare sample ($N=774$)(probability values)

	Planned contrast	Unplanned contrasts		
	TSF vs. CBT+MET	TSF vs. CBT	TSF vs. MET	CBT vs. MET
During treatment				
Percentage of days abstinent	.95 (.92) [1]	.65	.57	.26
Percentage of days abstinent$_{Linear}$	.63 (.79)	.77	.57	.75
Percentage of days abstinent$_{Quadratic}$	.16 (.69)	.49	.07	.21
Drinks per drinking day	.37 (.58)	.68	.24	.39
Drinks per drinking day$_{Linear}$	.77 (.88)	.59	.99	.54
Drinks per drinking day$_{Quadratic}$	.50 (.94)	.68	.43	.67
Posttreatment: Months 4–15				
Percentage of days abstinent	.27 **(.05)**	.09	.78	.12
Percentage of days abstinent$_{Linear}$	**.01 (.003)**	.04	.02	.69
Percentage of days abstinent$_{Quadratic}$	.07 **(.02)**	.10	.10	.99
Drinks per drinking day	.57 (.33)	.29	.96	.22
Drinks per drinking day$_{Linear}$	.49 (.27)	.38	.72	.57
Drinks per drinking day$_{Quadratic}$	.16 (.05)	.13	.32	.55

[1] Probability values excluding the site × treatment × matching attribute interaction are in parentheses.

direction. In this regard, the contrast of CBT and MET (PDA$_{Linear}$ months 4–15) should not be significant, which was the case.

Causal Chain Analyses

The prospective hypothesis was partially supported in the aftercare sample, but only on the abstinence measure and only midway through the 12 months of followup. Examination of the causal mechanisms underlying the hypothesis was undertaken to untangle the complex matching findings. As before, hierarchical regression analyses were conducted with attention directed to the interaction term as evidence of a differential relationship between meaning-seeking and causal variables. Likewise, extreme values of percentage of days AA attendance led to the removal of a limited number of cases, and findings did not differ when these cases were included in the analyses.

Table 4 gives the results of the causal chain analyses for the aftercare sample. Surprisingly, despite the partial support for the matching hypothesis in the aftercare sample on the frequency of drinking measure, none of the tests of a differential relationship between meaning-seeking and causal variables was significant. Specifically, no differential relationship was found between meaning-seeking and therapy process, AA attendance, or AA involvement measures. The only trend ($p<.10$) was in a direction opposite to that predicted: Meaning-seeking was negatively related with AA involvement during treatment for TSF clients.

Additional analyses were conducted to identify where the meaning-seeking assumptions went astray. A major concern was the discrepancy between outpatient and aftercare samples in the relationship between meaning-seeking and subsequent AA attendance for TSF clients. Many aftercare clients received exposure to AA principles and attended AA meetings during their formal inpatient treatment experience. In tandem with the fact that the TSF modality was highly effective in boosting AA attendance, it is plausible that the proposed relationship was overwhelmed in the aftercare sample because of uniformly high AA attendance rates in each of the three treatment conditions.

Table 4. Summary of causal chain analyses for aftercare sample (*N*=774)

Causal (criterion) variable	Interaction	TSF	CBT+ MET
Therapy process			
Client Satisfaction With Treatment	$p<.939$	.10	.06
WAI: Relationship Bond	$p<.450$	−.12	−.04
WAI: Goal Compatibility	$p<.737$	−.09	−.11
WAI: Task Compatibility	$p<.890$	−.08	−.04
Percent Therapy Sessions Attended	$p<.239$	.04	−.07
AA attendance			
Months 1–3	$p<.804$	.06	.07
Months 4–6	$p<.780$	.04	.02
Months 6–9	$p<.361$	.11	.04
AA Involvement			
Months 1–3	$p<.060$	−.10	.08
Months 4-9	$p<.153$	−.07	.05

NOTE: WAI refers to client ratings of the therapeutic relationship (at Week 2 of treatment) using the Working Alliance Inventory (Horvath and Greenberg 1986). Unstandardized β weights.

We reasoned that while meaning-seeking may not have predicted differential rates of AA exposure at *specific* followup points, the matching variable may have predicted different patterns of AA attendance across time, which, in turn, might explain the partial matching effect. Tonigan and colleagues (in press) reported, for example, that discrete patterns of AA attendance in Project MATCH included the following categories:
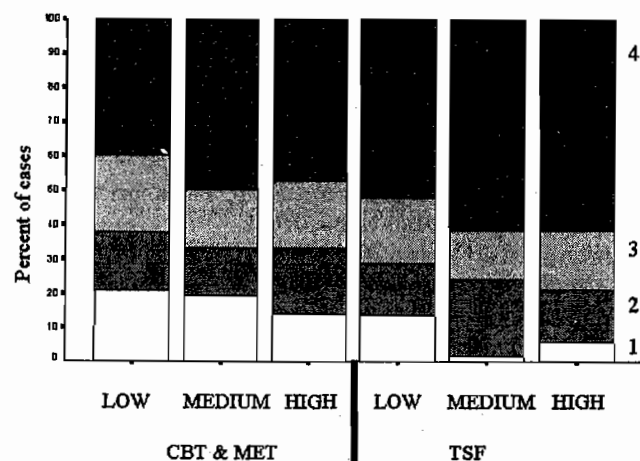
1. No AA attendance

2. AA attendance during the 12 weeks of treatment only

3. AA attendance during treatment with some attendance during followup up to but not past month 9

4. Sustained AA attendance during treatment and all followup months

5. Erratic AA attendance during and after treatment, with months between AA meeting attendance

Discarding the last category because of the limited number of cases, we conducted a Chi square test (4 × 6) to determine whether pattern of AA attendance (four categories) varied across the trichotomized meaning-seeking attribute nested within the a priori matching contrast (six categories).

Figure 4 depicts the interaction of interest ($\chi^2(15)=29.80$, $p<.013$), and offers substantial support for the underlying rationale of the meaning-seeking causal chain. In particular, about 60 percent of the medium and high meaning-seeking clients assigned to aftercare TSF attended AA throughout the treatment and followup phases of the study. In comparison, about 50 percent of the low meaning-seeking clients assigned to aftercare TSF reported sustained AA attendance. In contrast, high and medium meaning-seeking clients assigned to CBT and MET attended AA throughout the study about as much as low meaning-seeking clients assigned to TSF.

An important question was, did this finding replicate in the outpatient sample? Findings ($\chi^2(15)=203.41$, $p<.0001$) suggest that the

Figure 4. Patterns of AA attendance by trichotomized meaning-seeking attribute within matching treatment contrast (aftercare sample). 1 = No AA attendance; 2 = AA attendance during 12 weeks of treatment only; 3 = AA attendance during treatment with some attendance during followup up to but not past month 9; 4 = Sustained AA attendance during treatment and all followup months.

general relationship between patterns of AA attendance and meaning-seeking is stable in both the aftercare and outpatient samples. Specifically, high and medium meaning-seekers assigned to the outpatient TSF treatment reported more sustained AA attendance throughout the study than did low meaning-seekers in TSF. In addition, low meaning-seeking clients in TSF reported more sustained AA attendance than high meaning-seeking clients assigned to either CBT or MET. Not predicted, proportionally more high meaning-seekers assigned to TSF discontinued AA attendance after treatment than did low and medium meaning-seekers assigned to TSF.

Discussion

What can be learned from these complex findings? Some aspects of the predicted causal chain were supported, and others were not. The TSF treatment did significantly increase AA attendance, relative to the CBT and MET groups, in both arms of the trial. We did not find, however, that high meaning-seeking clients were differentially enthusiastic and compliant with the TSF treatment, as we had predicted. If anything, the higher meaning-seekers were differentially *unenthusiastic* about the goals and tasks presented to them in outpatient CBT and MET, and this relationship was absent in TSF. Thus, although the expected pattern (positive slope for TSF and no relationship for other groups) was not found, the direction of differential preference was as predicted for outpatients.

Planned causal chain analyses did not explain the partially supported meaning-seeking matching effect in the aftercare sample. Our hypothesis that meaning-seeking would be more strongly and positively related with treatment compliance and AA attendance within TSF during treatment was not supported.

Was the absence of a differential relationship between meaning-seeking and AA attendance the result of the unexpected and high overall rate of AA attendance in the aftercare sample? Post hoc analyses support this interpretation. In particular, high and medium meaning-seeking clients assigned to aftercare TSF had more

sustained AA attendance throughout the study than low meaning-seeking clients in TSF. This relationship was tacitly assumed in the causal model but not explicitly specified in the a priori causal chain model.

We believe findings in the outpatient and aftercare samples can be meaningfully integrated. First, client meaning-seeking was predictive of different rates (outpatient) or patterns (aftercare) of AA attendance. In the outpatient sample, this relationship became manifest quickly because it was unconfounded by prior inpatient treatment emphasis on AA. In the aftercare sample, this relationship was confounded by initially high rates of AA attendance in all treatments, but became manifest in the latter part of the study. In both samples, the assumption that client meaning-seeking was positively predictive of comfortability with treatment tasks, goals, and therapist bonding was not supported. Whether these findings will be replicated with more detailed process-oriented variables warrants future research.

The key mechanism of increased AA attendance in the meaning-seeking causal model was supported in both samples, but the predicted matching effect was only partially obtained in the aftercare sample. Why? It is our belief that a focused and high threshold in formal 12-step emphasis is required to produce the matching effect, a threshold met in the aftercare sample but not for TSF outpatients. If true, 12-step focused therapies should consider methods to enhance treatment fidelity when implementing client treatment matching strategies.

Before drawing conclusions, some caveats are in order. First, Project MATCH was not designed as a study of AA per se, but only of a Twelve-Step Facilitation therapy as one of three approaches in treating alcohol problems. Measures of AA attendance and involvement such as those selected for use in this trial implicitly assume that AA is a homogeneous entity. In fact, there are substantial differences among AA groups, and stronger affiliation and prognostic profiles might emerge from analyses sensitive to AA group heterogeneity (Montgomery et al. 1993; Tonigan et al. 1995).

It is also possible that the measure of meaning-seeking used in this study, albeit normally distributed, was not optimal as an operational definition of hitting bottom. It showed only a weak prognostic relationship to treatment outcomes in general and largely failed to predict differential response to treatments. Future studies might seek a multivariate definition of hitting bottom that includes not only meaning-seeking but other measures such as severity of negative consequences and dependence, depression and hopelessness, and perceived lack of personal control over drinking. Factor or cluster analytic strategies could be applied to identify the complex phenomenon of hitting bottom. Alternatively, a criterion-referenced definition could be derived by regression strategies. Although this contains some risk of logical circularity, hitting bottom is in fact popularly conceptualized as the final crisis that precedes recovery.

Acknowledgment

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Religiosity and Responsiveness to Alcoholism Treatments

*Gerard J. Connors, Ph.D., J. Scott Tonigan, Ph.D., and
William R. Miller, Ph.D.*

ABSTRACT

The proposition evaluated in this chapter is that clients who are more comfortable with religious beliefs and practices would derive greater benefit from a treatment that incorporated spiritual themes and practices. In terms of the Project MATCH treatments, it was expected that clients with higher levels of religiosity would benefit more from the Twelve Step Facilitation (TSF) treatment than would clients lower in religiosity. No relationship beyond a weak prognostic effect of religiosity on treatment outcome was predicted for clients in the Cognitive-Behavioral Coping Skills Therapy or Motivational Enhancement Therapy conditions. Tests of this matching hypothesis revealed no support for the predicted match among either the outpatient or aftercare populations sampled. The evaluation of the causal chain presumed to underlie the hypothesized matching effect showed limited support for the proposed chain among aftercare clients, where it was found that religiosity among the TSF clients was linearly related to the degree of therapeutic task compatibility. In terms of other analyses, it was found that aftercare clients reported greater religiosity at pretreatment than did outpatient clients and that pretreatment religiosity predicted positive posttreatment drinking outcomes. Taken together, religiosity did not emerge as a viable matching dimension with the treatments evaluated in Project MATCH, although it does appear that religiosity may play a role in the prediction of the therapeutic relationship among aftercare clients and of posttreatment drinking behavior. Future research on these relationships will help specify the role of religiosity in alcoholism treatment and identify circumstances under which religiosity might productively be focused on in the treatment endeavor.

Despite the consistent indication that religion plays a significant role in many people's lives (e.g., Hoge 1996), there has been remarkably little research on the role of religiosity and religious beliefs in treatment specifically and the behavior change process more generally. This lack of systematic research attention has been evident in the general psychotherapy literature as well as in addictions treatment research (Larson et al. 1998).

Project MATCH provided the opportunity to evaluate differential outcomes associated with response to three alcoholism treatments as a function of pretreatment levels of client religiosity. To our knowledge, no prospective study has examined whether client religiosity interacts with alcoholism treatment modalities to produce differential outcomes. In the arena of treatment for depression, Propst (1980) found in a randomized trial that religiously oriented clients with depression fared better when spiritual themes were integrated into a cognitive restructuring intervention than when such material was omitted, regardless of the religious

Gerard J. Connors, Ph.D.
Research Institute on Addictions
1021 Main Street
Buffalo, NY 14203
E-mail: connors@ria.buffalo.edu

orientation of the therapist. Propst et al. (1992) subsequently replicated this finding in another clinical trial, demonstrating differential ineffectiveness of "nonspiritual" cognitive-behavioral therapy for religious-oriented depressed individuals when treated by nonreligious therapists.

As described in detail elsewhere (Project MATCH Research Group 1993), three treatments were employed in Project MATCH: Cognitive-Behavioral Coping Skills Therapy (CBT; Kadden et al. 1992), Motivational Enhancement Therapy (MET; Miller et al. 1992), and Twelve Step Facilitation (TSF; Nowinski et al. 1992). The use of these three treatments with two distinct clinical populations—outpatients and aftercare clients—permitted the evaluation of predictions regarding differential outcomes associated with extent of client religiosity and participation in these three treatments. The proposition developed for evaluation in this chapter is based on a "comfort model" between client characteristics and treatment philosophy and content. In this regard, it was expected that clients who are more comfortable with religious beliefs and practices would derive greater benefit from a treatment that incorporated spiritual themes and practices. In terms of the Project MATCH treatments, it was expected that clients with higher levels of religiosity would benefit more from the TSF treatment than would clients lower in religiosity. No relationship beyond a weak prognostic effect of religiosity was predicted for the CBT and MET conditions.

There are a variety of ways in which spiritual dimensions manifest themselves in a 12-step-based intervention. A review of the 12 steps reveals a heavy emphasis on faith in God (Step 2), surrender to God's will (Step 3), prayer and continued meditation (Step 11), and other spiritual behaviors (Steps 8–10). A therapeutic focus on these issues was hypothesized to be more comfortable, acceptable, and effective specifically for clients more attuned to and/or in need of personal religiosity.

The TSF treatment used in Project MATCH was designed in part to encourage and facilitate attendance at and participation in Alcoholics Anonymous (AA) meetings. There have been modest positive correlations reported between

client religious and spiritual practices and AA affiliation. For example, extent of religious and spiritual activities, such as prayer and meditation, has been found to be positively related to AA affiliation (Fichter 1982; Laundergan and Kammeier 1978). Relatedly, Harris et al. (1990) reported that individuals who felt that God actively worked in their lives were significantly more likely to affiliate and that direct experiences of God also were positively related to affiliation.

The present chapter describes the evaluation of the matching hypothesis that individuals higher in religiosity would benefit more from the TSF intervention than would clients lower on this dimension, and that there would be no such relationship (beyond a weak prognostic effect) among clients receiving the CBT and MET interventions. In addition, the causal chain developed to account for the proposed match is described and evaluated.

Methods

Operationalizing Religiosity

The total score from the Religious Background and Behaviors (RBB) questionnaire (Connors et al. 1996) was used to assess religious practices. The RBB is composed of 13 items. On the first item, clients identified the term that best describes them: atheist, agnostic, unsure, spiritual, religious. On the following six items, the clients indicated (on an 8-point Likert scale) the frequency with which they had engaged in the following behaviors during the past year: thought about God, prayed, meditated, attended worship services, read/studied scriptures/holy writings, and had direct experiences of God. The last six items assessed these domains in terms of lifetime occurrence on a 3-point ordinal scale. The item content was intended to capture behaviors traditionally associated in the literature with religiosity. Past year and lifetime assessments were used so that recent religious behaviors could be identified.

The first item of the RBB was assigned a score from 0 to 4, ranging from atheist to religious (atheist=0, agnostic=1, and so forth). The

remaining items were recoded before summing to calculate summary scale scores. Specifically, each of the remaining responses was reset such that 1=0, 2=1, 3=2, 4=3, and so forth. This procedure was implemented to establish an RBB scale scoring floor of zero (rather than 13).

Psychometric evaluation of the RBB (Connors et al. 1996) has shown that the measure comprises two factors, labeled God Consciousness and Formal Practices, and that the RBB possesses excellent test-retest reliability and satisfactory internal consistency. In this regard, the test-retest correlation over a 3-day interval was found to be 0.97, and the internal item consistency for the combined study arms (outpatient and aftercare) at intake to be 0.86 (N=1637).

Statement of the Matching Hypothesis

A single between-group slope contrast was proposed with regard to the interaction of pretreatment religiosity and treatment in influencing two drinking outcome variables: percentage of days abstinent (PDA) and drinks per drinking day (DDD). *Specifically, it was predicted that (a) religiosity and PDA would be significantly and positively related within the TSF condition, with a weaker relationship manifest within the combined CBT and MET conditions and (b) religiosity and DDD would be significantly and negatively related within the TSF condition, with a weaker relationship manifest within the combined CBT and MET conditions.*

Statement of the Causal Chain

It was predicted that the TSF therapeutic focus would be more acceptable to clients reporting such behaviors as regular practice of prayer, meditation, direct experiences of God, and reading of scriptures. This acceptability was predicted to become manifest in higher rates of TSF therapy attendance (relative to clients with lower levels of religiosity), higher rates of AA attendance and involvement during the 12 weeks of treatment, and more positive client reports of the client-therapist therapeutic alliance (as measured in the second week of treatment using the Horvath and Greenberg (1986) Working Alliance Inventory (WAI)). It was believed that these facets of the

therapeutic process combined would lead to more positive posttreatment outcomes.

Results

Preliminary Analyses

General sample characteristics for the two arms of the study are described elsewhere (Project MATCH Research Group 1997). Examination of baseline RBB total scores indicated that aftercare clients reported significantly higher (p<.01) mean RBB scores (M=38.61, SD=11.31) than outpatients (M=35.36, SD=10.94), with no main effect of gender on RBB mean scores (p<.06). Intake RBB total scores were weakly and positively related with AA attendance in the 90 days prior to study recruitment (r=0.11 for outpatients, r=0.13 for aftercare clients), and involvement in AA for the year prior to recruitment was moderately related with RBB total scores (r=0.22 for outpatients, r=0.27 for aftercare clients).

Virtually no relationship was found within study arm (outpatient, aftercare) between RBB scores and measures of psychiatric severity (Alcohol Severity Index (ASI; McLellan et al. 1980) psychiatric severity subscale and the Beck Depression Inventory (BDI; Beck et al. 1961)), with the largest absolute value of r equal to 0.05. In terms of the two primary dependent measures (PDA and DDD, assessed at baseline), RBB scores were more related to PDA, having a weak association in the aftercare arm (r=0.15) and a weaker yet association in the outpatient arm (r=0.08). Consistent with measures of alcohol consumption, RBB scores were unrelated or weakly related to adverse consequences reported by aftercare clients (r=0.01) and outpatients (r=0.10).

Aftercare Sample

Prognostic Effect of RBB

The prognostic effect of baseline RBB scores on treatment outcome was examined in two phases. First, the univariate correlations between scores on the RBB and the trial's two primary outcome measures (PDA and DDD) were

calculated for the 6-month period following the end of treatment. The correlation between RBB scores and PDA was 0.08 ($p<.05$) and between RBB scores and DDD was -0.02 ($p>.50$). Looking at the RBB subscales, the correlations between the God Consciousness subscale scores and PDA and DDD, respectively, were 0.03 ($p>.40$) and 0.02 ($p>.50$). The correlations between the Formal Practices subscale scores and PDA and DDD, respectively, were 0.10 ($p<.01$) and -0.05 ($p>.15$).

Next, the prognostic effect of RBB scores on treatment outcome was examined after controlling for baseline drinking, site, treatment, and time (linear and quadratic) main effects and their interactions. Analyses of the prognostic effects of this secondary matching variable on the trial's two primary outcome measures (PDA and DDD) were thus derived from the larger hierarchical linear modeling (HLM) analyses examining potential matching effects of the RBB variable.

A significant and positive main effect of the RBB on PDA for months 4–15 was found after controlling for baseline drinking, site, time, and treatment main effects and their interactions ($p<.01$). This finding indicated that RBB scores at intake were linearly related to PDA across the 12-month posttreatment period. Post hoc dismantling of the total RBB measure into its two subscales (God Consciousness and Formal Practices) suggested that extent of self-reported formal religious practices (e.g., regularity of church attendance) accounted for the overall prognostic effect. Although RBB scores positively predicted the frequency of abstinence (i.e., PDA), no relationship in the aftercare arm was found between baseline RBB scores and drinking intensity (i.e., DDD) during the 12 months of followup ($p<.48$). Little variation by site was found ($p<.16$), and examination of the relationship between drinking intensity and the two subscales of the RBB likewise suggested the absence of a statistically or clinically significant finding.

Matching Effects

The formal RBB matching hypothesis stated that RBB and posttreatment PDA would be positively related within the TSF condition and

that a weaker relationship would be found between RBB and PDA within the combined CBT and MET conditions. It was also predicted that RBB and DDD would be negatively related in the TSF condition and, again, that a weaker relationship would be found between RBB and DDD within the combined CBT and MET conditions.

Testing of the RBB matching hypothesis was conducted using the HLM procedure. Discussed in detail elsewhere (Project MATCH Research Group 1997; Longabaugh and Wirtz, this volume, pp. 4–17), this procedure led to the testing of the a priori contrast in three ways: (1) an overall matching effect involving slope comparisons of TSF versus CBT and MET collapsed across time, (2) a contrast of TSF and CBT and MET slopes as they changed across time in a linear function, and (3) changes across time in the specified contrast in a quadratic context. Thus, conducted separately for aftercare and outpatient samples, 6 significance tests (3 tests × 2 dependent measures, PDA and DDD) were used to evaluate the RBB matching hypothesis.

Table 1 summarizes the probability values derived from the HLM analyses using PDA and DDD as the primary dependent measures in the a priori RBB secondary matching hypothesis. Findings are presented for the 12-week phase of treatment labeled "during treatment," and for the 12-month posttreatment period labeled "after treatment." Along with the planned contrast labeled TSF versus CBT+MET, three unplanned pairwise contrasts are reported for exploratory purposes. None of the a priori contrasts supported the prediction of a differential relationship by treatment between intake RBB scores and PDA or DDD during treatment or during the 12 months of followup. Likewise, none of the exploratory post hoc pairwise contrasts supported the hypothesis that the relationship between PDA and RBB scores would vary by treatment condition.

Casual Chain Analyses

Lack of support for the RBB secondary matching hypothesis led us to question whether the proposed therapeutic mechanisms failed to become operative during treatment as predicted

Table 1. Summary of aftercare HLM religiosity and responsiveness to treatment hypothesis tests: Probability values associated with tests of during and after treatment client-treatment matching

	Predicted match TSF vs. MET+CBT	Unplanned matching contrasts		
		TSF–CBT	TSF–MET	CBT–MET
During treatment				
PDA	.39	.43	.50	.91
PDA linear	.91	.92	.92	.69
PDA quadratic	.19	.09	.09	.24
DDD	.21	.30	.25	.91
DDD linear	.75	.83	.73	.90
DDD quadratic	.19	.52	.11	.34
After treatment				
PDA	.18	.21	.30	.82
PDA linear	.45	.36	.70	.60
PDA quadratic	.56	.69	.54	.83
DDD	.40	.64	.32	.60
DDD linear	.39	.40	.52	.83
DDD quadratic	.84	.78	.94	.83

or, instead, whether proposed mechanisms became operative during treatment but failed to influence treatment outcomes as predicted. Path analyses were used to examine these questions, dividing treatment outcomes as either proximal (months 4–9) PDA and DDD or as distal (months 10–15) PDA and DDD. Several strategies were evaluated in deriving estimates of posttreatment drinking outcome. Monthly PDA and DDD values were considered most consistent with the HLM analyses, but conducting 12 path analyses for each primary dependent measure would result in 48 analyses across the two study arms, which would be clearly undesirable from a type 1 error rate perspective. Alternatively, selection of a few months to examine the proposed mechanisms had merit, but how were months to be selected? In the end, we considered the proximal and distal measures to be both clinically relevant and more stable indices of posttreatment functioning.

Figure 1 shows the path analytic findings separately for the TSF and combined CBT and

MET conditions in the aftercare sample. The first link in the causal chain predicted a more positive relationship between the three measures depicting therapeutic working alliance collected after the second week of therapy and pretreatment RBB scores in the TSF condition relative to the combined CBT and MET conditions. This prediction was partially supported. In the TSF condition, pretreatment RBB scores were significantly and positively related to client agreement on TSF therapeutic tasks, but not to agreement on therapeutic goals and client-therapist bonding. Also predicted, these measures describing therapeutic alliance were unrelated to pretreatment RBB scores in the combined CBT and MET groups.

The second link of our causal model predicted that increased comfortableness with therapy at Week 2 would result in higher rates of AA attendance during treatment, increased therapy compliance—measured by therapy attendance—and greater satisfaction with therapy when measured at the 3-month followup. Only one of nine possible relationships in the TSF path analysis supported this prediction, i.e., WAI goal predicting satisfaction with treatment ($\beta=0.26$, $p<.05$). Thus, we concluded that the second link in our casual model was not tenable. Finally, we proposed that increased AA and therapy attendance and satisfaction with treatment would produce more positive outcomes. This prediction received strong support on both primary dependent measures at proximal and distal followup periods for both TSF and the combined CBT and MET groups.

Outpatient Sample

Prognostic Effects of RBB

The correlations between baseline RBB scores and PDA and DDD (for the 6-month period following treatment), respectively, were
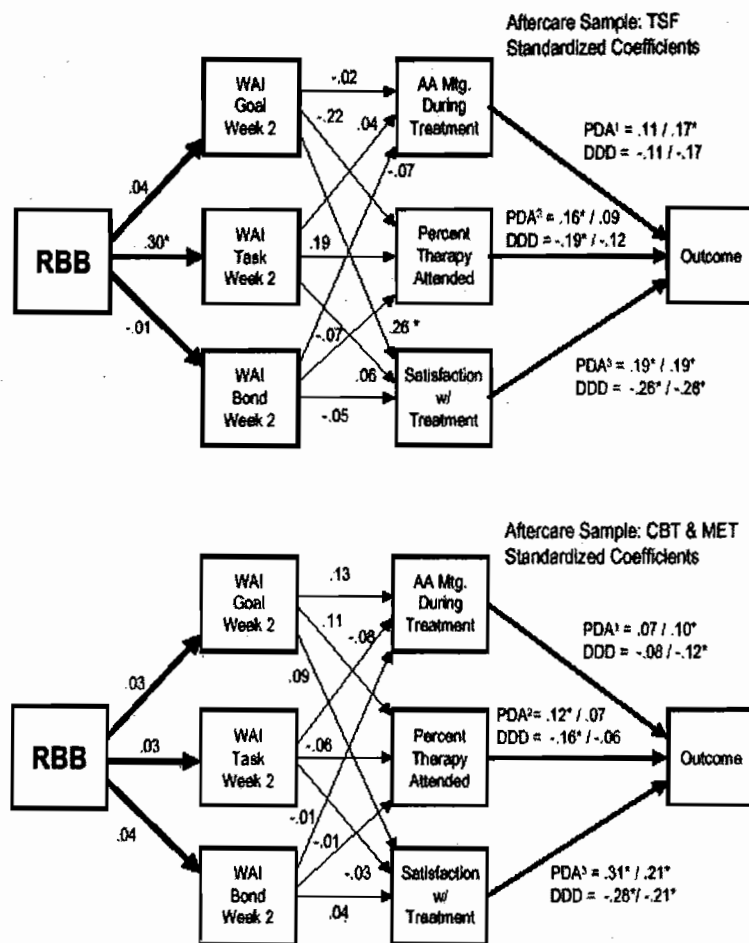
Figure 1: Comparison of aftercare TSF and combined CBT and MET path analysis models assessing religiosity as a differential predictor of treatment response. For the PDA and DDD outcomes, the superscripts (1, 2, 3) indicate that in each case the first number provided (before the slash) is the result for the proximal (months 4–9 posttreatment period) outcome, and the second number after the slash is the result for the distal (months 10–15 posttreatment period) outcome.

0.08 ($p<.05$) and -0.07 ($p<.10$). The correlations between the God Consciousness subscale scores and PDA and DDD, respectively, were 0.09 ($p<.01$) and -0.04 ($p>.25$). The correlations between the Formal Practices subscale scores and PDA and DDD, respectively, were 0.06 ($p<.10$) and -0.07 ($p<.05$).

The prognostic effect of RBB scores on outcome next was examined after controlling for baseline drinking, site, treatment, and time (linear and quadratic) main effects and their interactions. As before, these analyses of the prognostic effects of this secondary matching variable on the PDA and DDD were thus derived from the larger HLM analyses examining

potential matching effects of the RBB variable. Baseline RBB scores and frequency of posttreatment abstinence were not related in the outpatient arm ($p<.29$). Examination of the RBB interactions with site and time indicated minimal variation, and, hence, limited qualification to these main effect analyses. RBB scores, however, were significantly and negatively predictive of posttreatment drinking intensity such that higher baseline RBB scores were predictive of less DDD during the 12 months of posttreatment followup ($p<.044$). Study of the two RBB subscales showed that much of this prognostic effect was accounted for by the Formal Practices scale.

Matching Effects

The a priori RBB matching hypothesis was identical for outpatient and aftercare clients, and the proposed mechanisms in our causal model paralleled those described for the aftercare sample. Table 2 provides the probability values associated with the HLM tests of the during and after treatment periods using the two primary dependent measures. Unplanned pairwise contrasts are also provided for exploratory purposes. As shown, none of the planned contrasts for the RBB matching hypothesis were supported on either dependent measure either during or after treatment. Likewise, accounting for the large number of significance tests, no support was found for a differential effect of pretreatment RBB scores in any of the unplanned pairwise contrasts reported in table 2. Consistent with findings in the aftercare sample, no support was found for asserting that pretreatment religiosity is an important consideration in assigning clients to treatments similar to those offered in Project MATCH.

Causal Chain Analyses

Figure 2 shows the path analysis models depicting the proposed mechanisms underlying the RBB a priori hypothesis. Like the aftercare analyses, treatment outcome was divided according to proximal (months 4–9) and distal (months 10–15) periods. Standardized coefficients (β) indicated that the first link of our model was not supported in the TSF condition. Specifically, pretreatment RBB scores were not predictive of client perceptions of therapeutic working alliance at 2 weeks in the TSF condition. Further, with one exception (WAI task agreement and AA meeting attendance, $\beta=0.25$, $p<.05$), perceptions of therapeutic working alliance were not predictive of mechanisms proposed to effect differential outcomes, i.e., increased AA and therapy attendance and greater treatment satisfaction. As among the aftercare participants, the expectation that the increased AA and therapy attendance and satisfaction with treatment would produce more positive outcomes was generally supported for both TSF and the combined CBT and MET groups. Thus, the mechanisms proposed in the model to effect change (AA attendance, therapy attendance, treatment satisfaction) did so. Although these factors predicted change, the effect was not differential across treatment modalities as would be required for matching to occur.
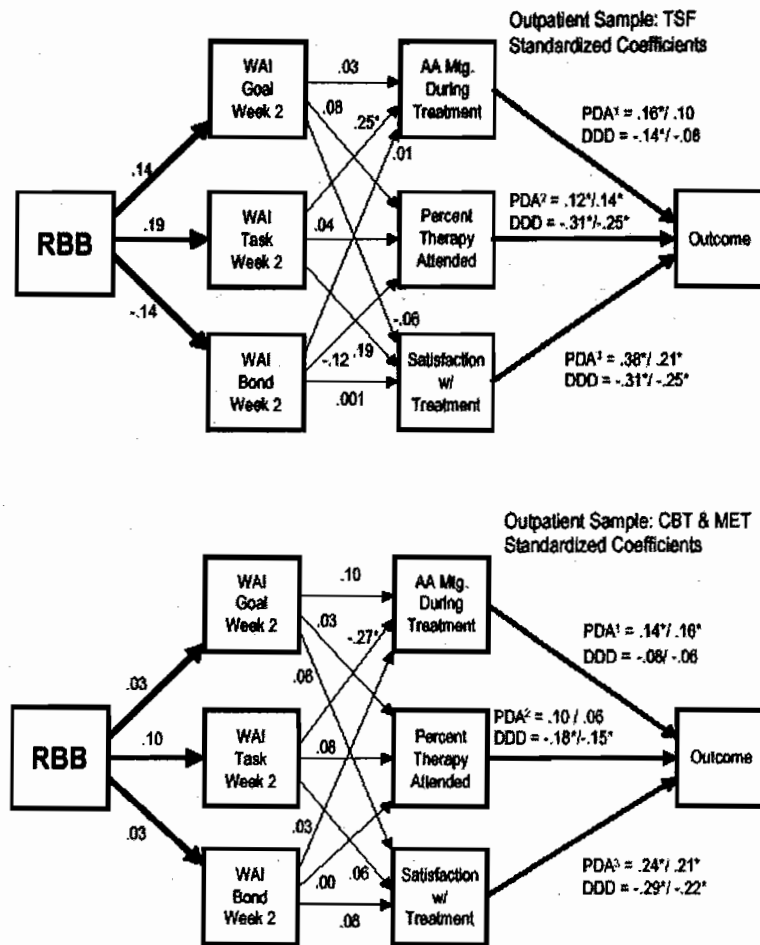
Discussion

The formal testing of the hypothesis that pretreatment religiosity would be positively related to posttreatment drinking outcomes within the TSF condition and only weakly related within the combined CBT and MET conditions was not supported. As such, it does not

Table 2. Summary of outpatient HLM religiosity and responsiveness to treatment hypothesis tests: Probability values associated with tests of during and after treatment client-treatment matching

	Predicted match TSF vs. MET+CBT	Unplanned matching contrasts		
		TSF–CBT	TSF–MET	CBT–MET
During treatment				
PDA	.38	.43	.48	.90
PDA linear	.79	.88	.75	.89
PDA quadratic	.98	.92	.95	.88
DDD	.55	.64	.57	.95
DDD linear	.71	.67	.83	.82
DDD quadratic	.99	.83	.84	.69
After treatment				
PDA	.80	.95	.80	.86
PDA linear	.62	.78	.25	.17
PDA quadratic	.34	.09	.91	.07
DDD	.77	.86	.75	.90
DDD linear	.88	.20	.28	.02
DDD quadratic	.85	.96	.69	.67

Figure 2: Comparison of outpatient TSF and combined CBT and MET path analysis models assessing religiosity as a differential predictor of treatment response. For the PDA and DDD outcomes, the superscripts (1, 2, 3) indicate that in each case the first number provided (before the slash) is the result for the proximal (months 4–9 posttreatment period) outcome, and the second number after the slash is the result for the distal (months 10–15 posttreatment period) outcome.

appear that matching clients on the basis of religiosity to these alcoholism treatments will yield differential outcomes (at least as assessed in the context of percentage of days abstinent and drinks per drinking day).

The evaluation of the causal chain for the outpatients provided no support for the presumed underlying mechanisms of the hypothesis. In this regard, there was no differential relationship by treatment (TSF versus CBT and MET combined) between level of religiosity and therapeutic alliance. It would appear at the least that this matching hypothesis was not supported because of the erroneous assumption that a 12-step approach would be more

acceptable to clients higher in pretreatment religiosity.

A different picture emerged from the causal chain analysis for the aftercare clients. Here it was found that religiosity within the TSF condition was positively related to one of the dimensions of the therapeutic alliance (task compatibility). There was no such relationship for aftercare clients in the other two treatment conditions. Thus, there was some support for the causal chain in the aftercare arm, although it did not manifest itself in increased engagement in the proposed active ingredients of TSF. However, the paths between this alliance component and AA attendance during treatment were not significant.

Although the aftercare causal chain analyses provided support for certain links in the chain, most links were unconnected. For example, therapeutic alliance did not lead to greater levels of AA attendance during treatment. Nevertheless, the finding that religiosity was positively related to one aspect of therapeutic alliance among aftercare clients is noteworthy and might be pursued productively in subsequent research on engaging clients in the therapeutic process and on the working alliance between clients and therapists more generally.

The results discussed above concern the role of religiosity in differential relation to the TSF and combined CBT and MET treatments. However, there were other, more general, findings that are noteworthy and have implications for future clinical research. First, it was of interest that aftercare clients reported greater levels of religiosity than did outpatients. It is possible that the relationship between religiosity and therapeutic alliance in a 12-step facilitation treatment will be evident in clients with an overall higher level of religiosity (as in the case of these aftercare clients). However, this possibility is speculative, and there exists a host of other explanations that might account for that relationship emerging in this aftercare population.

A second finding of note was that pretreatment religiosity predicted outcomes in both the outpatient and aftercare arms of the trial, albeit on different outcome measures. Religiosity positively predicted posttreatment percentage of days abstinent (but did not predict drinks per drinking day) among aftercare clients, and negatively predicted drinks per drinking day (but did not predict percentage of days abstinent) among the outpatients. Thus, in each case religiosity was associated with better outcomes. Interestingly, these prognostic effects in both cases appeared to be carried by the formal religious practices scale of the RBB measure. This is consistent with the more general robust finding that religious involvement is a protective factor against the development of alcohol problems (Gorsuch 1995).

Taken together, these findings raise several interesting questions for subsequent clinical research on religiosity. While religiosity did not emerge as a viable matching dimension with the treatments evaluated in Project MATCH, it does appear that religiosity may play a role in the prediction of the therapeutic relationship (at least among aftercare clients) and of posttreatment drinking behavior. Future research on these relationships will help specify the role of religiosity in alcoholism treatment and identify circumstances under which religiosity might productively be focused on in the treatment endeavor.

Acknowledgments

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The Interpersonal Dependency Matching Hypothesis

Robert G. Rychtarik, Ph.D.

ABSTRACT

Individuals high in interpersonal dependency were predicted to have better outcomes when assigned to Twelve Step Facilitation (TSF) treatment relative to either Cognitive-Behavioral Coping Skills Therapy (CBT) or Motivational Enhancement Therapy (MET). TSF was thought to satisfy their dependency needs by stressing reliance on a "higher power" and the support and nurturance of the Alcoholics Anonymous (AA) group. Their higher level of attendance and satisfaction with TSF treatment and their high level of AA involvement were predicted to mediate their improved outcomes over interpersonally dependent individuals in CBT and MET. Individuals low in interpersonal dependency, on the other hand, were predicted to have better outcomes in CBT and MET relative to TSF. These clients were predicted to benefit most from CBT and MET, which emphasize individual self-management and self-change, respectively. These hypotheses were not supported. Some limited support was found for the notion that within the MET outpatient sample, high interpersonally dependent individuals had slightly poorer posttreatment outcome in percentage of days abstinent than did those low in interpersonal dependency. At long-term followup, results also suggested that, among the more intense treatments (i.e., CBT and TSF), high interpersonally dependent individuals fared better on drinking intensity outcomes relative to those low in interpersonal dependence. These effects, however, were small. Limitations of the interpersonal dependency measure and the need to study interpersonal dependency in the context of other variables are discussed.

Contemporary conceptualizations define interpersonal dependency as the extent to which an individual strives for and works to maintain nurturant, supportive relationships (Bornstein 1992). The interpersonal dependency construct has been associated with the development and progression of alcoholism for some time. As summarized by Bornstein (1992), several correlational studies have shown a positive association between dependency and alcoholism. Overall, alcoholic individuals have been found to have higher scores on dependency measures than abstainers or social drinkers, even when controlling for other psychopathology.

Prospective, longitudinal research, however, suggests that premorbid dependency level does not predict subsequent risk for the onset of alcoholism (Jones 1968, 1971; Kammeier et al. 1973; Vailant 1980). Rather, dependency-related behaviors (e.g., dependent thoughts, feelings, and behaviors) show a significant increase upon the development of alcohol problems. Thus, interpersonal dependency appears to be a result of the alcohol problem rather than the cause of it. Nevertheless, level of interpersonal dependency at the time of treatment may in turn influence subsequent relapse and treatment outcome and may interact with treatment approach.

Robert G. Rychtarik, Ph.D.
Research Institute on Addictions
1021 Main Street
Buffalo, NY 14203
E-mail: rychtari@ria.buffalo.edu

Rationale for the Matching Hypothesis

A basic assumption of the Twelve Step Facilitation (TSF; Nowinski et al. 1992) approach is that recovery from alcohol dependence can be achieved through redirecting an individual's dependency needs onto a "higher power" and creating dependence on the support and nurturance of the Alcoholics Anonymous (AA) group. This approach contrasts markedly with the Cognitive-Behavioral Coping Skills Therapy (CBT; Kadden et al. 1992) and Motivational Enhancement Therapy (MET; Miller et al. 1992) approaches in which emphasis is placed, in general, on an individual's own self-management and decision-making. The current hypothesis is, therefore, based on the assumption that the level at which an individual strives for and works to maintain supportive relationships (i.e., level of interpersonal dependency) will interact with treatment type to influence outcome.

Individuals high in interpersonal dependency are hypothesized to be more responsive to the TSF model given that it complements their own cognitive schema and addresses their own psychological needs by providing and stressing the importance of reliance on supportive relationships with a higher power and the AA group. It is hypothesized that individuals high in interpersonal dependency will benefit most from the TSF condition because they will work harder to win the approval of their therapist and the support group and will attend AA more frequently.

While highly dependent individuals also may be compliant and learn new skills in the CBT condition over the course of treatment, they may have difficulty implementing and/or maintaining them in the posttreatment environment in the absence of additional structured support and nurturance for such change—which is particularly important for them. Thus, these individuals are hypothesized to have poorer outcomes under the CBT condition.

Similarly, highly dependent individuals also are hypothesized to benefit less in the MET condition due to the fewer treatment sessions available upon which to develop the therapeutic relationship, level of support, and nurturance required by these individuals. In addition, as with the CBT condition, the absence of structured support and nurturance posttreatment may make it more difficult for these individuals to implement and/or maintain treatment gains.

It should be noted that while differences may exist between the CBT and MET conditions during treatment (due primarily to the intensity of treatment provided and the opportunity for individuals high in interpersonal dependency to develop a strong therapeutic relationship), the current hypothesis focuses on posttreatment functioning and predicts no difference between CBT and MET in the long term.

Individuals low in interpersonal dependency are hypothesized to respond less favorably to the TSF group relative to the CBT and MET conditions due to their already higher levels of self-reliance and less need for the high level of support and nurturance that may be present in self-help groups. These individuals may respond most favorably to CBT and MET given the emphasis on self-management and self-change in these conditions. In fact, individuals low in interpersonal dependency are hypothesized to view the TSF treatment as less acceptable given its heavy emphasis on reliance on others and therefore may fail to follow through with treatment and AA group attendance.

Individuals low in interpersonal dependency are not hypothesized to differ with respect to outcome between the CBT and MET conditions. These individuals are predicted to do well in the planned absence of any additional posttreatment support that characterizes these two treatment conditions.

Recent research on the interaction between family functioning and interpersonal autonomy (a measure of interpersonal dependency) provides some support for the current hypothesis. McKay and colleagues (1992) found that interpersonal autonomy alone did not predict drinking outcome at posttreatment. Autonomy, however, was found to interact with pretreatment family functioning to predict outcome. Clients who were low in autonomy and who reported high levels of family dysfunction at pretreatment had poorer drinking outcomes at followup. Among high-autonomy subjects, however, pretreatment family functioning was unrelated to

drinking at followup. Thus, individuals with high levels of interpersonal dependency (i.e., low autonomy) appear to be vulnerable to more and heavier drinking in the absence of supportive, nurturing relationships in the family. Individuals with low levels of dependency (i.e., high autonomy) appear to be immune from the effects of family dysfunction. Importantly, this effect was found only for male clients.

In a subsequent report, McKay and associates (1993) found that for low-autonomy individuals, perceived improvement in family functioning during treatment was associated with better outcome at followup. For high-autonomy individuals, however, no significant association between improvement in family functioning and outcome was found. Taken together, while the studies by McKay and colleagues do not specifically address the current hypothesis, they do provide some of the first empirical support for the possible mediating role of interpersonal dependency in alcoholism treatment outcome.

Finally, some additional indirect support for the current hypothesis can be derived from research on predictors of affiliation with AA. Among other variables, high affiliative and group dependency needs have been suggested in some studies to be associated with affiliation with AA (see Ogborne and Glaser 1981). Importantly, AA affiliation also has been positively associated with improved outcome among individuals during and following treatment (Emrick et al. 1993). Thus, the improved outcome predicted for high interpersonal dependency individuals in the TSF condition may result from their greater affiliation with AA during and after treatment.

To summarize, empirical research on the interaction between interpersonal dependency and treatment type is extremely limited. The theoretical support for the above hypothesis far outweighs the empirical evidence, hence the current hypothesis is necessarily exploratory in nature.

The Matching Hypothesis

The dependency by treatment interaction hypothesis can be summarized as follows. *The higher the level of interpersonal dependency prior to treatment, the higher the percent of posttreatment abstinent days (and the lower the number of drinks per drinking day) in the Twelve Step Facilitation relative to the Cognitive-Behavioral Coping Skills Therapy and Motivational Enhancement Therapy conditions. The lower the interpersonal dependency prior to treatment, the higher the percentage of abstinent days (and the lower the number of drinks per drinking day) under the MET and CBT conditions and the lower the percentage of abstinent days (and higher drinks per drinking day) under TSF.* In sum, interpersonal dependency was expected to be positively associated with outcome in TSF but to have a negative or nonsignificant relationship with outcome in both CBT and MET.

Figure 1 gives a diagrammatic presentation of the variables and pathways within each treatment condition hypothesized to mediate the interaction between interpersonal dependency and treatment type. The figure depicts the pathways from pretreatment interpersonal dependency to attendance, treatment satisfaction, posttreatment AA involvement, and subsequent proportion of abstinent days. It was anticipated that the pathway from interpersonal dependency to proportion of treatment sessions attended would be significant and positive in the CBT and TSF conditions but not in the MET condition.

In addition, it was hypothesized that the positive dependency-attendance relationship would be higher in TSF relative to CBT. Interpersonal dependency also was anticipated to be strongly related to higher levels of treatment satisfaction at the end of treatment among participants in TSF relative to participants in either CBT or MET. In fact, higher levels of dependency were predicted to be negatively related to satisfaction with treatment among MET participants.

Interpersonal dependency also was predicted to have positive direct and positive indirect effects (i.e., through attendance and treatment satisfaction) on AA involvement during the posttreatment period among TSF participants but not among participants in either CBT or MET. This effect, in turn, was anticipated to indirectly and positively influence subsequent
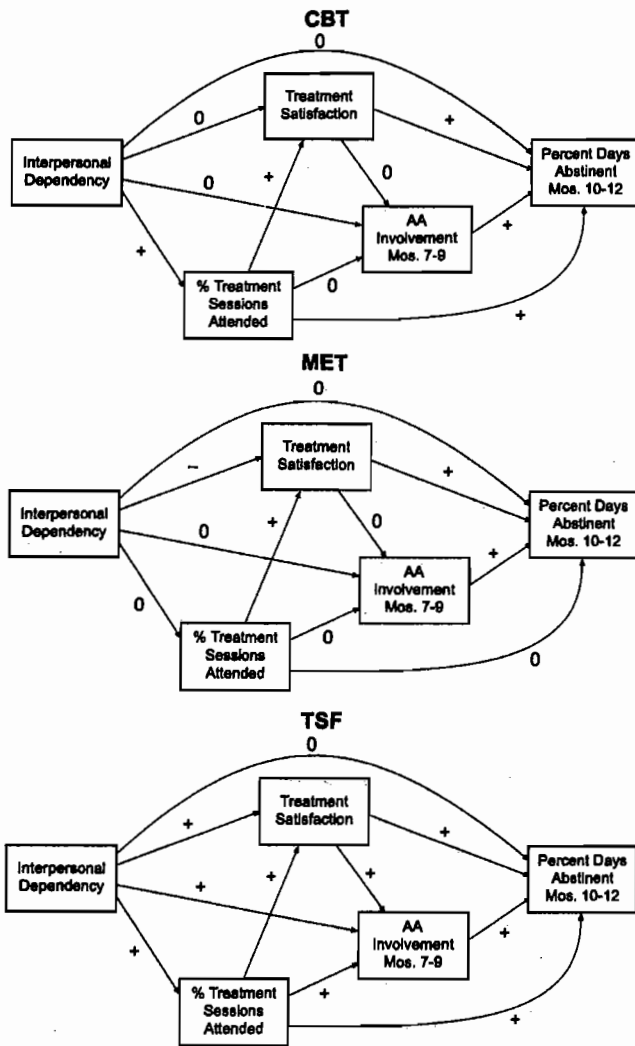
Figure 1. Causal model of the interpersonal dependency by treatment interaction hypothesis

percentage of days abstinent and negatively influence drinks per drinking day in the TSF group.

It should be noted that no significant direct effect of interpersonal dependency on outcome was predicted. Rather, interpersonal dependency was predicted to indirectly affect outcome through its direct effects on treatment attendance, treatment satisfaction, and AA involvement. As shown in figure 1, these indirect pathways were all predicted to be positive in the TSF condition but either negative or nonsignificant (designated "0" in the figure) in the CBT and MET conditions. A similar model (not shown) also was applied to the drinks per drinking day

variable. For this outcome measure, however, better functioning was exhibited by lower levels of drinking.

Operationalization of the Matching Variable

Interpersonal dependency was measured using the 14-item Assertion of Autonomy Scale (AAS) of the Interpersonal Dependency Inventory (IDI; Hirschfeld et al. 1977). The IDI is one of a number of widely used measures of dependency (Bornstein 1992) and overall shows good reliability and construct validity. The AAS is one of three factor-analytically derived scales of the IDI. The scale is proposed to measure the extent to which individuals profess to be indifferent to or independent of the evaluation of others and the extent to which they express the belief that their self-esteem depends on the approval of others. Hirschfeld and associates (1977) reported a cross-sample factor-analytic congruency coefficient of greater than 0.80 for this scale. Split-half reliability coefficients in three different samples ranged from 0.72 to 0.91. As administered, high scores on this scale reflect higher levels of independence and thus lower levels of interpersonal dependency.

Responses on the AAS have not been found to be influenced by age, social desirability, depression, or anxiety. Educational level has shown a small but significant positive relationship with autonomy. Also, men have been found to report significantly higher levels of autonomy than women (Hirschfeld et al. 1977). The AAS was also successfully used in McKay and colleague's (1992, 1993) research examining influences on drinking outcome (see above). For the purpose of the present hypothesis, scoring was reversed on the AAS so that high scores on the scale reflected higher levels of interpersonal dependency.

Results

Findings regarding the hypothesized prognostic association between alcohol involvement and each of the two primary outcome measures, percentage of days abstinent (PDA) and drinks per drinking day (DDD), are presented first.

Next, the results of tests of the predicted interaction for each arm and each outcome measure are given. Finally, the variables hypothesized to account for the interaction (or its failure) are shown using path analyses. Results are presented separately for outpatient and aftercare arms.

Outpatient Arm

Prognostic Effect of Interpersonal Dependency

No significant interpersonal dependency effect or dependency by time interaction was observed for either PDA or DDD during either the period of treatment or 12-month followup among outpatients. The effect of interpersonal dependency did approach significance at the 39-month followup ($p<.0649$).

Interaction of Interpersonal Dependency With Treatment

Table 1 presents results of the tests of the overall interpersonal dependency by treatment interaction terms for PDA and DDD for both treatment and followup periods. Also included are tests of the effects of the interaction over linear and quadratic time as well as tests of the

individual treatment contrasts. No overall significant treatment by interpersonal dependency interaction was found in the outpatient arm within the treatment period. During the posttreatment period, however, the dependency by treatment interaction approached noncorrected significance ($p=.054$) for PDA. Individual contrasts indicated this potential interaction reflected differences in slopes between CBT and MET and not the predicted differences between TSF and CBT or MET. The nature of this potential interaction on PDA collapsed across the followup period, using multiple regression procedures, is further depicted in figure 2. Consistent with our hypothesis, there was a significant, though small, negative association between interpersonal dependency and PDA in the MET condition. However, no significant dependency-PDA association was found in either the CBT or TSF groups.

At the 39-month followup, the interaction between interpersonal dependency and treatment condition approached significance for PDA ($p=.09$) and was significant at the uncorrected level of $p=.02$ for DDD. The latter interaction, however, was not in the predicted direction. As shown in figure 3, there was no significant relationship between interpersonal dependency and DDD in the MET condition. In both the CBT and

Table 1. Interpersonal Dependency—Outpatient

Treatment contrast		Within treatment						Posttreatment					
		MV × Tx		MV × Tx × T		MV × Tx × T²		MV × Tx		MV × Tx × T		MV × Tx × T²	
		PDA	DDD	PDA	DDD	PDA	DDD	PDA	DDD	PDA	DDD	PDA	DDD
CBT–MET	*F*	1.41	-.71	.93	.51	-.05	-1.36	2.41	-1.81	-.11	-1.02	-2.02	.67
	p	.15	.48	.35	.61	.96	.18	**.02**	.07	.91	.31	**.04**	.50
CBT–TSF	*F*	.16	.76	1.01	-.11	.01	-1.58	.94	-.24	-1.19	.88	-1.29	.90
	p	.87	.44	.31	.91	.99	.11	.35	.81	.23	.38	.20	.37
MET–TSF	*F*	-1.22	1.42	.06	-.60	.06	-.18	-1.47	1.54	-1.02	1.82	.76	.19
	p	.22	.16	.96	.55	.95	.85	.14	.12	.31	.07	.44	.85
MV × Tx	*F*	1.15	1.01	.64	.21	.00	1.49	2.92	1.85	.83	1.66	2.12	.45
	p	.31	.36	.53	.81	1.00	.22	.054	.16	.43	.19	.12	.64

MV = matching variable, Interpersonal Dependency; Tx = treatment; T = linear time; T² = quadratic time; PDA = percentage of days abstinent; DDD = drinks per drinking day
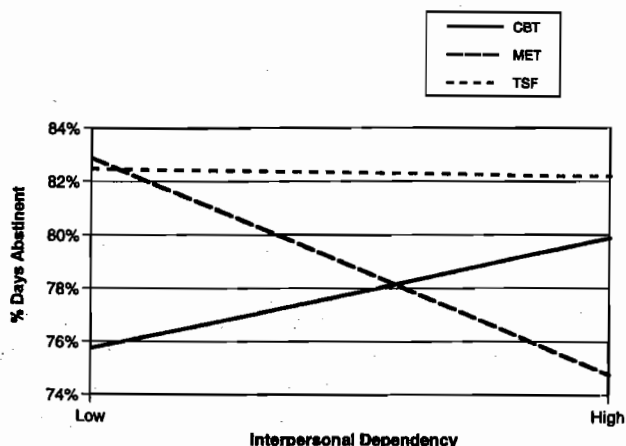
Figure 2. Nature of interpersonal dependency by treatment interaction approaching significance for Percentage of days abstinent across followup months 4–15 in the outpatient arm.
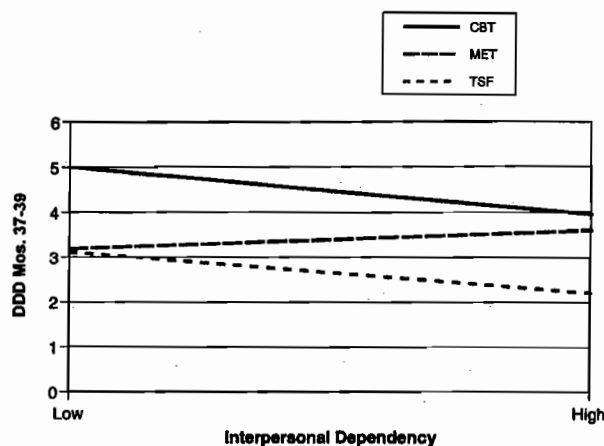

Figure 3. Noncorrected significant interpersonal dependency by treatment interaction on drinks per drinking day (DDD) for long-term followup months 37–39 in the outpatient arm.

TSF conditions, however, higher levels of interpersonal dependency were associated with fewer drinks per drinking day. This effect occurred in the presence of a significant main treatment effect (p=.0251) which favored TSF.

These results must be viewed with caution given the long-term nature of the followup. Nevertheless, the findings suggest that level of interpersonal dependency is not related to drinking intensity outcomes in low-intensity treatments such as MET. In higher intensity treatments, however, the higher the interpersonal dependency, the better the outcome.

It is interesting to note that at high levels of interpersonal dependency, the predicted effect was supported (i.e., individuals were doing better in TSF than in either CBT or MET). At low levels of interpersonal dependency, however, TSF and MET both appear to result in better outcomes than CBT. The essentially parallel slopes of TSF and CBT, however, indicate that the relationship between interpersonal dependency and DDD is not significantly different between these treatments. Yet, because of the main effect for TSF, the level of outcome is different between the two groups.

The A Priori Causal Model

As noted above, there was no support for the hypothesized interaction between interpersonal dependency and treatment assignment. To identify the reasons for this failure, the

hypothesized causal model presented in figure 1 was examined within a structural equations framework with posttreatment followup drinking data.

The treatment satisfaction measure was the sum of 4 items on a posttreatment questionnaire which asked the clients to rate, on a 5-point scale, their satisfaction with the therapist (1 = Very Satisfied, 5 = Very Dissatisfied), whether they would return to the program in the future (1=Definitely Yes, 5=Definitely Not), the extent to which the program met their needs (1=Almost all of my needs have been met, 5= None of my needs have been met), and their overall satisfaction with the treatment received (1 = Very Satisfied, 5 = Very Dissatisfied). Preliminary analyses indicated that these 4 items formed a single factor which accounted for 68.5 percent of the variance. The internal consistency of this satisfaction measure was 0.84. For the purposes of this analysis, scoring of the satisfaction measure was reversed so high scores represented greater treatment satisfaction. AA involvement was measured using the AA Involvement Scale (Tonigan et al. 1996) administered at the 9-month (6 months posttreatment) followup. Treatment attendance represented the proportion of treatment sessions attended. The effect of these measures on predicting the PDA during followup months 10–12 was examined. The arcsine transformation was used for the attendance and PDA variables.

The path model was analyzed separately for each of the treatment groups and in a multi-group analysis using EQS (Bentler 1995). Analyses included only those clients for whom complete data on all variables in the model were available (N's of 238, 222, and 268 for CBT, MET, and TSF, respectively). The overall chi square was used to assess the comparability of the model across the different treatments. The results of the multiple-group analysis for PDA and DDD are presented in figures 4 and 5, respectively. A partially constrained model fit the data best for both PDA, χ^2=6.92, df=12, n.s., and

DDD, χ^2=10.97, df=12, n.s. Consistent with the hypothesis, AA involvement in months 7–9 was positively and significantly related to PDA in months 10–12, regardless of treatment condition. Moreover, as expected, proportion of sessions attended in TSF had a positive and significant effect on AA involvement that was not found in either CBT or MET. Similarly, higher satisfaction at posttreatment was significantly associated with more AA involvement in TSF but not in the other two treatments. The failure of the hypothesized interaction is evident, however, in the fact that interpersonal dependency
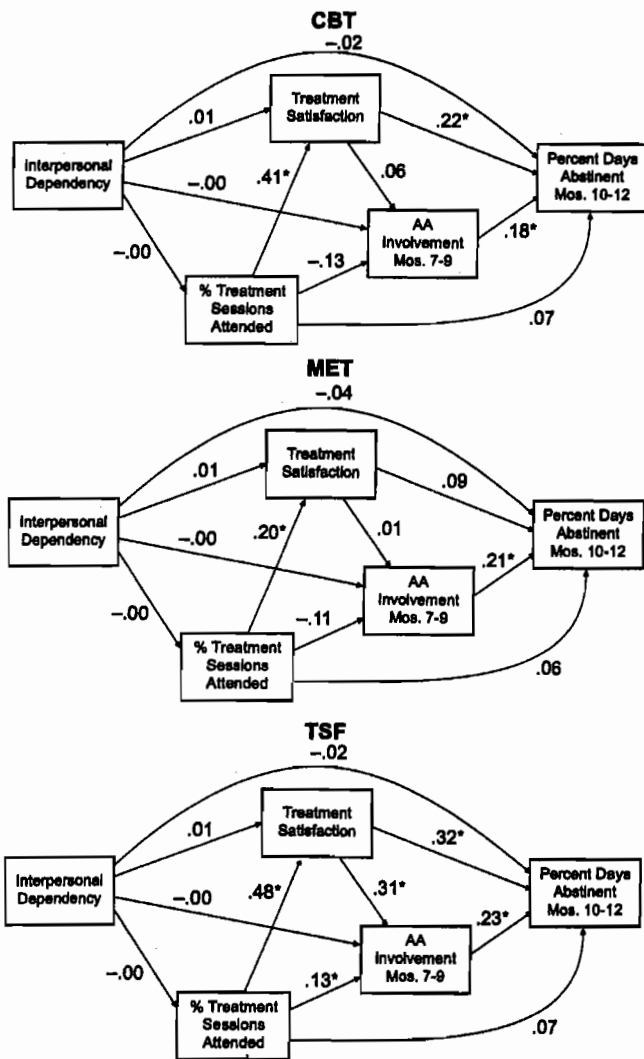

Figure 4. Multiple-group comparison of the causal model applied to percentage of days abstinent in the outpatient arm.
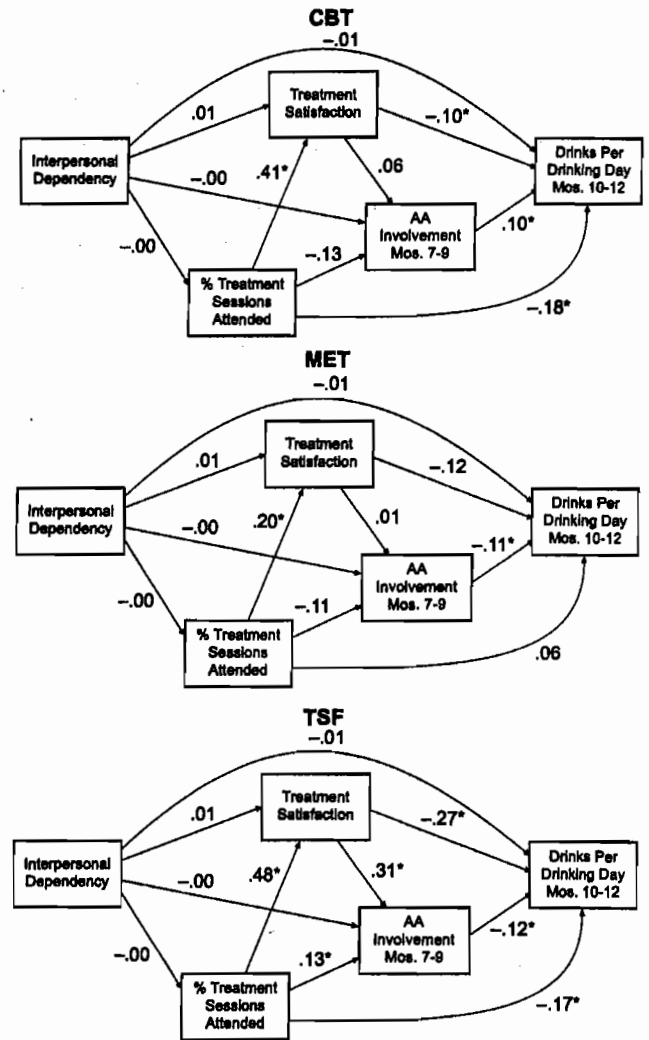

Figure 5. Multiple-group comparison of the causal model applied to drinks per drinking day in the outpatient arm.

showed no significant relationship with any other treatment or posttreatment variable in the model.

Aftercare Arm

Prognostic Effects of Interpersonal Dependency and the Interpersonal Dependency by Treatment Interaction

No significant effect of dependency on either outcome measure and no dependency by time interaction occurred in the aftercare arm (table 2). No significant or near significant interactions or individual contrast effects were observed.

The A Priori Causal Model

The multiple-group path analysis applied to the aftercare data also found the best fit in a partly constrained model for both PDA, $\chi^2 =$ 14.66, df=12, n.s., and DDD, χ^2=18.7, df=12, n.s., respectively (figures 6 and 7). Sample N's were 200, 191, and 170 for CBT, MET, and TSF, respectively. A pattern similar to that obtained in the outpatient arm was found. AA involvement during months 7–9 was significantly associated with a higher proportion of abstinent days in months 10–12. Attendance was positively associated with greater AA involvement in TSF but not in CBT or MET. Higher levels of satisfaction also were associated with more AA

involvement in TSF but not CBT or MET. Finally, unlike the outpatient arm, and contrary to predictions, interpersonal dependency was positively associated with AA involvement in the CBT condition but not in TSF or MET.

Discussion

We found no support for the hypothesis that interpersonal dependency interacts with treatment type to influence outcome. Some partial, yet very weak, support was obtained in the outpatient arm for the prediction that individuals high in interpersonal dependency would benefit less in the MET condition. However, this finding only applied to differences between CBT and MET and not TSF. In the long-term followup, we also found support for the notion that individuals high in interpersonal dependency benefited from either of the more intense treatments (i.e., CBT and TSF) relative to low-intensity treatment (i.e., MET). Given that the full interaction term either only approached significance or met uncorrected criteria in each case, we conclude that interpersonal dependency alone holds little clinical value as a variable for triaging clients to either CBT, MET, or TSF.

Results of the causal models were clear in demonstrating that interpersonal dependency had no direct or indirect effect on outcome

Table 2. Interpersonal Dependency—Aftercare

Treatment contrast		Within treatment						Posttreatment					
		MV × Tx		MV × Tx × T		MV ×Tx × T²		MV × Tx		MV × Tx × T		MV × Tx × T²	
		PDA	DDD	PDA	DDD	PDA	DDD	PDA	DDD	PDA	DDD	PDA	DDD
CBT–MET	F	.23	-.37	.25	-.90	-.51	.07	.87	-.62	-.72	.75	-.21	-.45
	p	.81	.71	.80	.37	.61	.94	.38	.53	.47	.45	.84	.65
CBT–TSF	F	1.53	-1.19	-.05	-.58	-1.39	.78	1.65	-1.51	.03	1.37	-.84	.27
	p	.13	.23	.96	.56	.16	.44	.10	.13	.98	.17	.40	.79
MET–TSF	F	1.31	-.85	-.28	.26	-.92	.72	.80	-.91	.72	.64	-.63	.69
	p	.19	.39	.78	.80	.36	.47	.42	.37	.47	.53	.53	.49
MV × Tx	F	1.32	.74	.05	.42	.98	.36	1.37	1.15	.35	.94	.38	.25
	p	.27	.48	.95	.66	.38	.70	.25	.32	.71	.39	.69	.78

MV = matching variable, Interpersonal Dependency; Tx = treatment; T = linear time; T^2 = quadratic time; PDA = percentage of days abstinent; DDD = drinks per drinking day
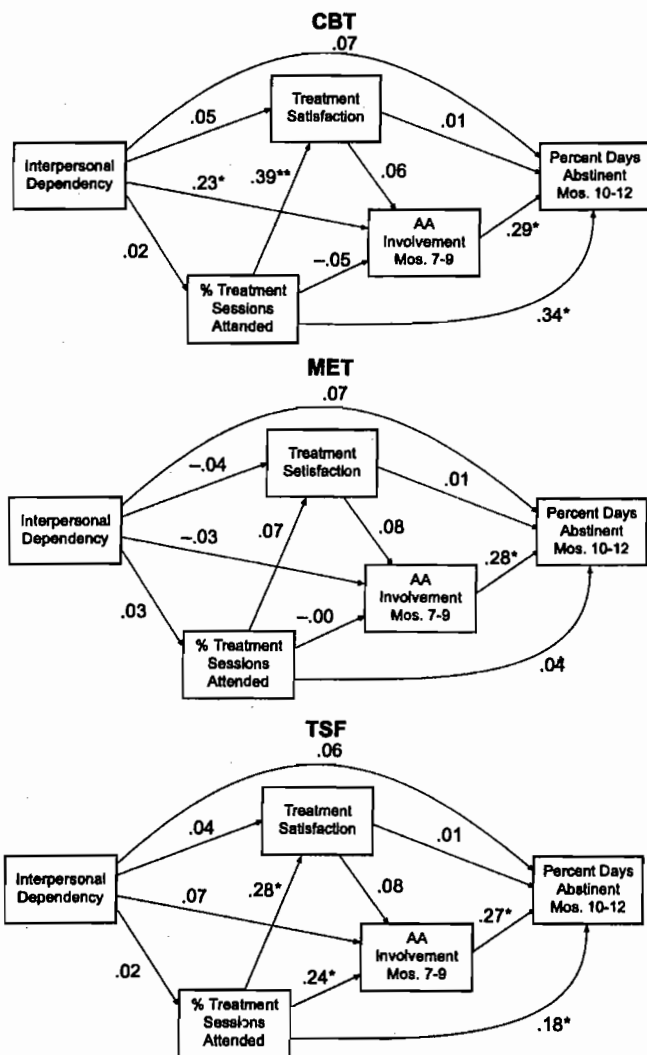
Figure 6. Multiple-group comparison of the causal model applied to percentage of days abstinent in the aftercare arm.
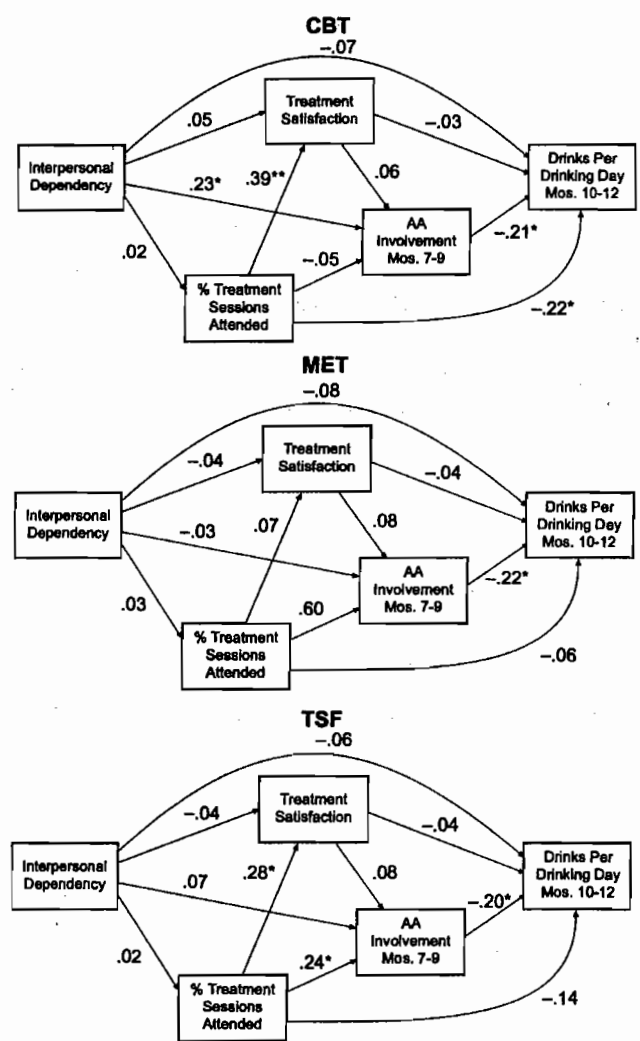
Figure 7. Multiple-group comparison of the causal model applied to drinks per drinking day in the aftercare arm.

among outpatients regardless of treatment type received. Only in the aftercare arm did dependency show a significant positive indirect effect on outcome through its positive direct association with AA involvement, and then only among CBT participants. Why this effect was found only in CBT is not clear. Perhaps the combination of a period of intense treatment (usually of a 12-step nature) followed by cognitive-behavioral treatment is an important factor in facilitating continued involvement in AA. The exact mechanisms of such a model, however, remain to be elucidated.

Some additional cautions regarding the current results must be made. First, we used only the Assertion of Autonomy Scale of the IDI (with reverse scoring) for our interpersonal dependency measure. It may be that use of other measures of dependency would yield different results. Also, it is perhaps not surprising that a measure of interpersonal dependency by itself would provide little value in client-treatment matching. Human behavior is so complex that only when interpersonal dependency is evaluated within higher order interactions with other variables (e.g., motivation, family functioning,

alcohol involvement) could its role on outcome be detected. In fact, the work of McKay and associates (1992, 1993) would appear to support this notion. Further exploratory analyses of the MATCH data set may help to explain such pathways.

In sum, interpersonal dependency was not found to interact with treatment type to influence outcome. While AA involvement was found to influence outcome, the hypothesized role of interpersonal dependency in mediating this relationship was not found. Research, with alternate dependency measures, that examines dependency in combination with other prognostic variables may further understanding in this area.

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The Gender Matching Hypothesis

Frances K. Del Boca, Ph.D., and Margaret E. Mattson, Ph.D.

ABSTRACT

This chapter evaluates the gender matching hypothesis in Project MATCH, which states that women will benefit more from Cognitive-Behavioral Coping Skills Therapy (CBT) than from Twelve Step Facilitation (TSF) and that the differential outcomes for the two treatments will be greater for female clients than for males. CBT was expected to address the ancillary problems (e.g., external stressors, negative mood) that are more prevalent among female alcoholics; at the same time, TSF, which would encourage women to attend Alcoholics Anonymous (AA) meetings, was expected to increase guilt and undermine self-esteem and assertion. Tests of the matching contrasts failed to provide support for the hypothesis in either arm of the trial. Gender did produce significant prognostic effects in analyses of the aftercare arm, with women reporting a higher proportion of abstinent days and fewer drinks per occasion than men did. Causal chain analyses produced mixed results. Male and female clients were shown to differ in terms of their initial treatment needs, and followup status with respect to these needs was related to drinking outcomes. Contrary to prediction, however, CBT sessions for women, as compared with those for men, were not appreciably more likely to teach general problem-solving or mood-management skills. Further, women did not avoid AA meetings. Attendance at self-help meetings was comparable for the sexes in the outpatient arm; in the aftercare study, women attended significantly more meetings and reported a higher degree of AA involvement.

Until recently, relatively few empirical studies have directly compared outcomes for alcoholic men and women in differing treatments (McCrady and Raytek 1993). Nevertheless, clinicians strongly recommend gender-specific approaches to the treatment of alcohol and other substance abuse problems. The literature is replete with reports contrasting male and female alcoholics along dimensions that are purported to have relevance for the delivery of treatment (cf. Del Boca 1994). Further, gender has often been implicated in alcoholism typologies, with the implicit or explicit suggestion that the etiology and course of alcoholism differ for the two sexes (cf. Del Boca and Hesselbrock 1996). The factors that contribute to gender differences are sometimes presumed to be fundamentally biological or genetic in origin; more often, however, the sources of gender-related variations are not fully articulated.

Rather, gender is regarded as a surrogate for a variety of genetic factors (e.g., biological sex) and sociocultural influences (e.g., gender-role prescriptions) that differentiate members of our two most important and recognizable social categories. This perspective is adopted in the present formulation.

The Hypothesized Matching Contrast

It is hypothesized that females will experience more favorable outcomes in Cognitive-

Frances K. Del Boca, Ph.D.
Department of Psychology
4202 East Fowler Avenue, BEH 339
University of South Florida
Tampa, FL 33620-8200
E-mail: fdelboca@chuma1.cas.usf.edu

Behavioral Coping Skills Therapy (CBT; Kadden et al. 1992) than in Twelve Step Facilitation (TSF; Nowinski et al. 1992) in Project MATCH and that this differential will be significantly larger for females than for males. No prediction is made about the direction of the difference between the two treatment modalities for males. A significant main effect for client sex, with women showing better outcomes than men, would be consistent with the literature. However, the gender hypothesis formulation for Project MATCH includes no prediction regarding gender main effects. The gender matching hypothesis may be represented as follows:

Females	Males
$[(CBT - TSF) > 0]$	$> > (CBT - TSF)$

Rationale for the Matching Hypothesis

Although there is little directly relevant research evidence for matching treatment to gender, there is considerable indirect empirical support in addition to theoretical justification.

Empirical Evidence

Major reviews of the treatment outcome literature on alcoholic women agree that there is limited research evidence regarding the differential effectiveness of various therapeutic modalities or treatment components (e.g., Vannicelli 1984; Institute of Medicine 1990; Lex 1990). Without differentiating among treatments, reviewers conclude, however, that female alcoholics benefit from treatment despite their greater concomitant psychological, social, and medical problems, and some studies report that they fare better at followup than their male counterparts (cf. Jarvis 1992; Vannicelli 1984; Vannicelli and Nash 1984; Annis and Liben 1980).

The limited research that has examined treatment outcomes for alcoholic women tends to be consistent with the matching hypothesis framed above. It should be emphasized, however, that this research has relied on uncontrolled studies that usually involve treatments that differ somewhat from those used in Project MATCH. For example, Lyons and associates

(1982) examined treatment outcomes for 1,340 clients from 17 alcoholism treatment programs in New York State. Programs were classified as having one of three different treatment orientations: peer group, rehabilitation, or medical. Alcoholic men achieved the most favorable outcomes when treated in programs with a peer-group orientation (similar to Alcoholics Anonymous); programs with rehabilitation and medical orientations reported comparable success rates, not far below those with a peer-group approach. In contrast, female clients fared best in medically oriented programs; the least improvement was observed for treatments with a peer-group orientation.

Similarly, female clients who received a gender-specific treatment in a random assignment study in Sweden achieved superior outcomes compared with women in conventional therapy (Dahlgren and Willander 1989). The authors concluded that women in the latter group were unwilling to be confronted by male clients, a likely circumstance in traditional 12-step programs.

In an attempt to examine factors that may contribute to differential outcomes for women and for men in alcoholism treatment, Jarvis (1992) analyzed 20 treatment outcome studies using meta-analytic techniques. Although the studies varied along many dimensions, Jarvis concluded that those showing a male advantage in terms of outcome more often involved "inpatient programmes incorporating psychotherapy, milieu therapy and Alcoholics Anonymous" (p. 1253). In contrast, according to Jarvis, alcoholic women tended to fare better in behavioral treatments.

Alcoholic women tend to have specific material needs and psychological problems that might be best addressed with particular treatment programs. Documented differences between female and male alcoholics that are pertinent to the treatment matching hypothesis can be summarized in terms of four interrelated domains:

- External stressors and negative mood
- Role demands
- Psychopathology and emotional problems
- Self-esteem and instrumentality

External Stressors and Negative Mood

Although some studies do not support the notion that women consume alcohol in response to stressful or traumatic events (Morrissey and Schuckit 1978; Cooke and Allan 1984), research has consistently found that women *attribute* their drinking to external stressors and negative mood states more often than do men (e.g., Morrissey and Schuckit 1978; cf. Lex 1990; Del Boca 1994). Compared with men, female alcoholics who seek treatment are more often unemployed and beneficiaries of public assistance. Data from panel surveys indicate that women drink to cope with difficult life events, especially reproductive problems (Wilsnak et al. 1986) and that they are more likely to do so than men (Institute of Medicine 1990). Such findings have led reviewers to argue that treatments that teach coping skills and relapse prevention techniques, such as cognitive-behavioral approaches, should be particularly effective for women (e.g., Lex 1990; Institute of Medicine 1990).

Role Demands

Alcoholic women often report having more childcare responsibilities and family problems than alcoholic men, and they are more likely than men to seek treatment specifically for marital problems, family disruption, physical illness, or emotional difficulties (e.g., Marsh and Miller 1985; Duckert 1987; Ginther and Kadden 1990). Such problems are frequently related to alcohol consumption but often are not acknowledged as such (Beckman 1984; McCrady and Raytek 1993), possibly because of the greater social stigma associated with alcoholism in females (Gomberg 1988). In addition to teaching women methods for resisting alcohol use, the cognitive-behavioral approach is likely to provide coping skills that will generalize to other difficult situations. Further, CBT, if successful, should challenge and alter maladaptive cognitions regarding alcohol use.

Psychopathology and Emotional Problems

Several studies have found that female alcoholics experience higher rates of psychiatric disorders, particularly affective disorders, than women in general. Diagnoses of depression and anxiety disorders are significantly more prevalent among female than among male alcoholics, who are more likely to evidence antisocial personality (ASP) disorder (Hesselbrock and Hesselbrock 1993). CBT, with its emphasis on the cognitive restructuring of perception, is likely to be most effective in helping women to overcome depression and anxiety. Further, because CBT teaches methods for managing stressful situations, women may be less likely to become involved in circumstances that contribute to depression and anxiety and that ultimately lead to drinking. CBT is also expected to be beneficial to alcoholic men with psychiatric problems. Male alcoholics high in sociopathy have been found to respond better to CBT than to other approaches (Kadden et al. 1989). Thus, the higher prevalence of ASP among alcoholic men suggests a possible advantage for CBT in Project MATCH.

Self-Esteem and Instrumentality

Many reviewers have noted that alcoholic women lack self-esteem and assertiveness. Female alcoholics are frequently characterized as passive, dependent, and low in self-efficacy (e.g., Beckman 1978). These attributes are often used to explain the tendency for women to be influenced by alcoholic or substance abusing significant others (Hser et al. 1987). As a consequence, several authors have recommended that the treatment of female clients include assertiveness training (e.g., Beschner et al. 1981; Institute of Medicine 1990; Lex 1990). As implemented in Project MATCH, an important goal of CBT treatment is to enhance self-efficacy and promote independent decision-making. The successful management of affect, cognition, and behavior over time, coupled with the effective application of coping strategies, particularly refusal skills, should serve to enhance self-esteem, increase feelings of self-efficacy, and promote instrumentality.

Theoretical Justification

In addition to alcohol and substance abuse research, several other lines of investigation

converge in support of the gender matching hypothesis. These include research and theory in the more general areas of sex differences and gender roles, and studies of the actual behavior of men and women in groups.

Factors which differentiate male and female alcoholics also tend to differentiate the sexes more generally. That is, nonalcoholic women differ from nonalcoholic men in terms of material resources, the prevalence of affective disorders and sociopathy, and other characteristics that distinguish their alcoholic counterparts (Hilton 1987, 1988). These and other sex differences can be summarized in terms of two salient features of traditional gender roles (Gilligan 1977):

- Females typically have less power than males, resulting in less control over resources and outcomes, with concomitant low self-efficacy and negative affect.

- Women evidence a greater concern for, and assume more responsibility for, the quality of interpersonal relationships.

In sum, by virtue of their socialization, social position, and sex stereotypic expectations, women are more likely than men to lack self-worth and instrumentality, to experience depression and anxiety, and to drink in response to stress and negative mood states. Because of their heightened sense of personal responsibility, and because of the greater social disapproval of female drinking, alcoholic women are also more likely to exhibit guilt and worry regarding the impact of their alcohol use.

Expressive and communal are terms used to characterize the psychological orientation associated with the emphasis on connection, feelings, and interpersonal relationships in the traditional female role; instrumental and agenic are used to summarize the self-assertive, autonomous, and controlling attributes that are central to the conventional male role (e.g., Block 1973; Spence 1985). Although the traditional feminine emphasis on interpersonal responsibility may contribute to the array of problems that alcoholic women present in treatment, lack of instrumentality is likely to be more problematic. In more general research on sex differences, high instrumentality has been found to be a strong predictor of self-esteem and psychological adjustment (e.g., Taylor and Hall 1982).

CBT is expected to be the most effective of the Project MATCH treatments for women because it directly addresses the problem areas characteristic of alcoholic women. In terms of gender-role orientation, CBT enhances the development of instrumentality and self-efficacy. Furthermore, it is the only Project MATCH therapy with active ingredients that effectively address problems other than drinking per se (negative affect, psychopathology, poor coping skills). Thus, CBT is the only treatment designed to deal specifically with those factors that differentiate alcoholic women and men, factors that are likely to contribute to female alcohol use prior to treatment and precipitate relapse following periods of sobriety.

Compared with CBT, TSF is hypothesized to be less effective for female clients for three reasons. First, although delivered individually in Project MATCH, a major aim of TSF is to involve clients in Alcoholics Anonymous (AA) and to encourage them to attend AA meetings. Because women are more socially stigmatized for heavy drinking, they more often drink alone. As a consequence, it has been argued that women prefer, and derive more benefit from, individual treatment, because the experience of social disapproval can be minimized (Jarvis 1992; Cronkite and Moos 1984). The confrontational style of many AA groups may exacerbate guilt feelings related to drinking without providing the coping skills necessary to deal effectively with negative mood states.

Second, the confrontational behavior characteristic of many AA meetings is incongruent with the traditional female role, which prescribes noncombative, conciliatory behavior for women. There is considerable research indicating that men are more dominant in mixed-sex groups than women, that they simply talk and interrupt more often, and that they are more likely to assume leadership roles (Bartol and Martin 1986). These tendencies are especially marked in groups with a preponderance of males. Since alcoholism is more prevalent among males than females, men in AA groups

are likely to outnumber women by a significant margin, which may discourage women from active participation.

Third, TSF is expected to be less effective than CBT because it fails to deal with problems relating to self-esteem and instrumentality. Because AA participants are urged to accept their powerlessness over alcohol and to put their faith in a higher power, this approach may tend to undermine, rather than promote, the development of instrumentality and a sense of self-worth.

In contrast to female clients, there are reasons to argue that alcoholic men will respond favorably to both CBT and TSF. As with their female counterparts, there is considerable heterogeneity within this population. Some males will evidence the same types of problems as have been described for females, and these men are expected to fare well in CBT. In addition, more positive outcomes for CBT clients high in sociopathy have been observed in prior treatment-matching research (Kadden et al. 1989), although this study employed group rather than individual therapy.

Twelve-step approaches also appear to benefit alcoholic men, particularly when participation occurs in groups (e.g., Cronkite and Moos 1984). It has been suggested that male clients benefit from group therapy because men, unlike women, tend to drink in groups. Heavy alcohol consumption in group settings is not only socially approved for men but is also quite consistent with gender-role expectations. Alcohol may serve a social function for men, and the camaraderie often associated with male drinking may find a substitute in group settings such as AA (Jarvis 1992). Because TSF is delivered as individual therapy in Project MATCH, it is anticipated that the positive outcomes experienced for TSF men will depend on the extent to which participants attend AA meetings as an adjunct to Project MATCH treatment.

Operationalization of the Matching Variable

Because gender is correlated with a variety of attributes that are related to treatment need, it might be argued that each of these other attributes offers an alternative explanation for any Gender × Treatment condition interactions obtained in Project MATCH. Conversely, it is suggested here that *gender effectively summarizes* a variety of interconnected individual difference factors that are related to drinking and differentially related to treatment response. More importantly, most of these differences arise in large part from individual and social expectations that are fundamentally based on gender (cf. Del Boca and Ashmore 1986). Thus, gender is an appropriate variable for use in matching clients to alcoholism treatment.

Gender was operationalized in terms of the client's self-identification as a male or female. The outpatient sample included 688 males and 264 females; participants in the aftercare arm were 619 men and 155 women. Thus, the majority of clients in both arms of the trial were male (72.3 percent in outpatient and 80 percent in aftercare). Specific sites varied in terms of their relative proportions of men and women, ranging from 10.8 percent females in one aftercare site to 35.4 percent in one outpatient site.

Only those clients assigned to the CBT and TSF treatment conditions were included in testing the hypothesis. This resulted in an outpatient sample of 453 men (217 in CBT, 236 in TSF) and 183 women (84 in CBT, 99 in TSF) and an aftercare sample of 405 males (202 in CBT, 203 in TSF) and 108 females (64 in CBT and 44 in TSF). Clients assigned to Motivational Enhancement Therapy (Miller et al. 1992) are reported for completeness.

Results

Matching and Prognostic Effects

Outpatient Arm

Table 1 presents a summary of the results of the latent growth curve analyses used to test the gender matching hypothesis. As shown, the hypothesis was not supported for either the 12-week treatment phase or the 1-year posttreatment followup period. This finding was consistent across the two primary outcome variables

Table 1. Gender effects—Outpatient arm

Treatment contrast		Within treatment						Posttreatment					
		MV × Tx		MV × Tx × T		MV × Tx × T²		MV × Tx		MV × Tx × T		MV × Tx × T²	
		PDA	DDD	PDA	DDD	PDA	DDD	PDA	DDD	PDA	DDD	PDA	DDD
CBT–MET	t	−1.13	.91	−.64	−.23	.79	−.28	.00	.44	−.16	−.05	−1.23	.07
	p	.26	.36	.52	.82	.43	.78	.99	.66	.87	.96	.22	.95
CBT–TSF	t	−1.97	1.46	.00	−.72	.70	−.31	−.73	1.14	1.27	1.48	−.34	−.30
	p	**.05**	.14	.99	.47	.48	.76	.46	.25	.20	.14	.73	.76
MET–TSF	t	−.84	.55	.69	−.50	−.11	−.02	−.74	.69	1.45	1.44	.95	−.38
	p	.40	.59	.49	.61	.91	.99	.46	.49	.15	.15	.34	.71
MV × TX	F	1.94	1.08	.29	.28	.36	.06	.37	.67	1.29	1.47	.83	.08
	p	.14	.34	.74	.75	.70	.94	.69	.51	.28	.23	.44	.92

MV=matching variable, Gender; Tx=treatment; T=time; T^2 =quadratic time; PDA=percentage of days abstinent; DDD= drinks per drinking day; CBT=Cognitive-Behavioral Coping Skills Therapy; MET=Motivational Enhancement Therapy; TSF=Twelve Step Facilitation
NOTE: All p values are nondirectional and should be halved to determine p values for a directional test.

in Project MATCH, percentage of days abstinent (PDA) and drinks per drinking day (DDD). Further, gender was not a significant predictor of drinking outcomes during either the 12-week treatment phase or the posttreatment period (Project MATCH Research Group 1997, 1998a).

The gender matching hypothesis was tested in the outpatient arm at the 3-year followup point. Again, there was no evidence to support the hypothesis nor was there a simple prognostic effect for either of the two primary outcome measures (Project MATCH Research Group 1998b).

Aftercare Arm

The results of tests of the gender matching hypothesis for the aftercare arm are presented in table 2. The hypothesis was not confirmed for either of the two timeframes examined (within treatment and posttreatment) in analyses of either dependent measure.

Gender did, however, have a significant but small prognostic effect on outcome, with aftercare women reporting higher proportions of abstinent days (p=.004) and fewer drinks per occasion (p=.038) than men, and the DDD effect became more pronounced over time (p=.017) (Project MATCH Research Group 1997).

The A Priori Causal Chain

Figure 1 is a schematic representation of the causal chain that underlies the gender matching hypothesis. This depiction follows the rationale presented above. Gender is associated with treatment needs that are believed to be more effectively addressed by CBT than by TSF. As suggested by prior research, female alcoholics are likely to experience more ancillary problems than males as well as guilt and anxiety in relation to drinking (external stressors/negative mood), to assume greater responsibility in spousal and parental roles (role demands), and to evidence higher levels of anxiety and depression (psychopathology/emotional problems). At the same time, they may be less able to cope with their problems as a result of low self-worth and self-assertion (self-esteem/instrumentality). Three specific aspects of CBT (that are missing in TSF) are thought to address these factors—skills training, mood management, and assertiveness training. The philosophy of AA and the confrontational style of AA meetings may impede recovery. Female clients are expected to improve differentially on intervening outcome measures (skill acquisition, improved role performance, reduction in psychopathology,

Table 2. Gender effects—Aftercare arm

| Treatment contrast		Within treatment						Posttreatment					
		MV × Tx		MV × Tx × T		MV × Tx × T^2		MV × Tx		MV × Tx × T		MV × Tx × T^2	
		PDA	DDD	PDA	DDD	PDA	DDD	PDA	DDD	PDA	DDD	PDA	DDD
CBT–MET	t	−.32	.03	−.47	−.01	−1.49	1.39	.08	−.15	−.73	.59	.31	.21
	p	.75	.98	.64	.99	.14	.16	.94	.88	.46	.56	.75	.83
CBT–TSF	t	−1.79	1.52	−1.41	.53	1.00	−.92	.42	.42	.84	.98	−.20	−.51
	p	.07	.13	.16	.60	.32	.36	.68	.67	.40	.33	.84	.61.
MET–TSF	t	−1.33	1.35	−.85	.49	2.30	2.13	.45	.53	1.45	−.34	−.47	−.66
	p	.19	.18	.40	.62	**.02**	**.03**	.65	.60	.14	.73	.64	.51
MV × Tx	F	1.70	1.36	1.00	.17	2.66	2.29	.12	.15	1.06	.50	.11	.24
	p	.18	.26	.37	.84	.07	.10	.88	.86	.35	.61	.89	.79

MV = matching variable, Gender; Tx = treatment; T = time; T^2 = quadratic time; PDA = percentage of days abstinent; DDD = drinks per drinking day; CBT = Cognitive-Behavioral Coping Skills Therapy; MET = Motivational Enhancement Therapy; TSF = Twelve Step Facilitation
NOTE: All p values are nondirectional and should be halved to determine p values for a directional test.

and improved self-efficacy) in response to these therapy factors which, in turn, are hypothesized to affect both the frequency and quantity of alcohol consumption.

Although the model depicted in figure 1 contains many components, it is a relative simplification of the processes that underlie the gender matching hypothesis. The cluster of characteristics that differentiate female from male

alcoholics in the hypothesized model tend to be interrelated, and their relationships to drinking and alcohol-related problems comprise a complex network of direct and indirect pathways. For example, stressful life events may contribute *directly* to alcohol use in females and *indirectly* to consumption through their impact on negative affective states, which also influence alcohol use. Drinking, in turn, tends to produce
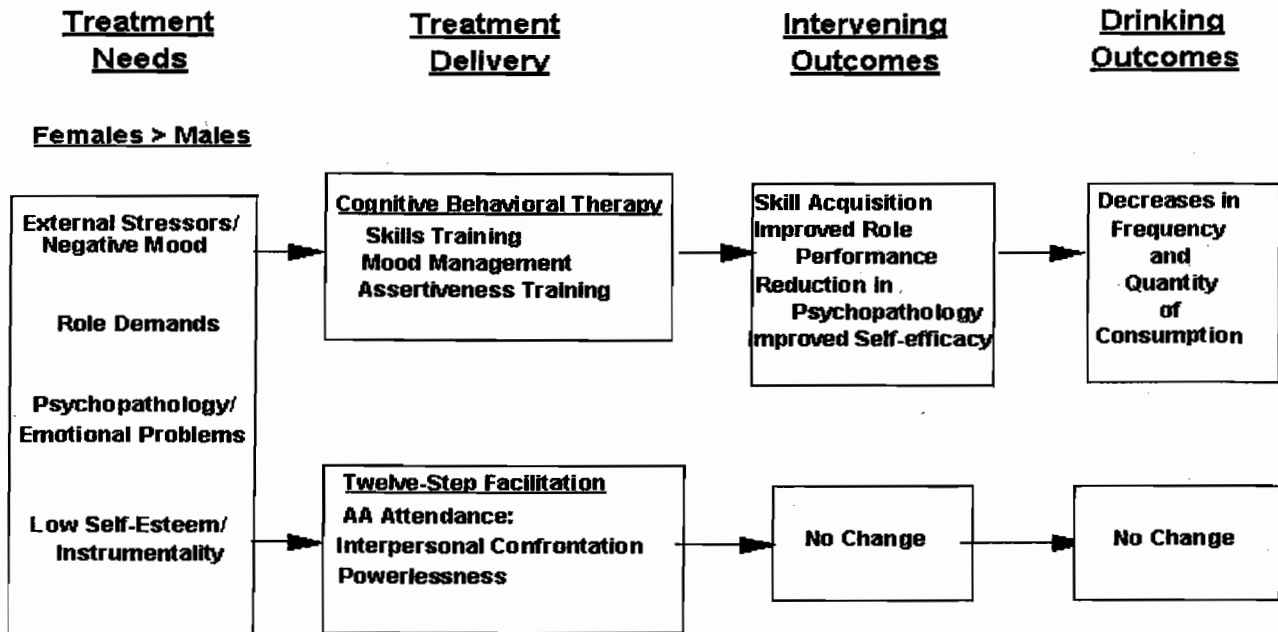
Figure 1. Gender treatment matching hypothesis causal chain.

problems that create stress and aggravate feelings of depression and anxiety. The active ingredients in CBT *collectively* influence the relevant intervening variables, which, in turn, result in decreased alcohol consumption.

Testing the Causal Chain

The causal chain outlined above involves four testable predictions, each of which may be phrased as a question:

- Are the hypothesized gender differences in treatment needs present at baseline?

- Did CBT and TSF treatment delivery differ as anticipated?

- Did the two treatments differentially affect the intervening variables as predicted?

- Are the intervening variables related to drinking outcomes?

Each question is examined in turn for the two arms of the trial.

Outpatient Arm

Are hypothesized baseline gender differences present? That is, did male and female clients in Project MATCH differ significantly in terms of treatment needs? To test this component of the causal chain, the sexes were compared on a variety of specific indicators that reflect the four domains specified in figure 1. Because the assessment battery was not designed specifically for this purpose, it was necessary to examine responses to individual items within questionnaires to operationalize these domains, in addition to examining scores on standardized measures. The results of t-tests comparing outpatient men and women on scale scores are summarized in table 3.

The Project MATCH assessment battery did not include a comprehensive measure of stressful life circumstances. However, two sets of items, one from the trial's screening questionnaire, the other from the Addiction Severity Index (ASI; McLellan et al. 1992), provide evidence of differential economic hardship and stressful life experiences. Females were significantly less likely to be employed than males (38 versus 58 percent), and they were also significantly more likely to report a history of physical or sexual abuse (60 versus 37 percent). Within the same domain, three scales from the Alcohol Use Inventory (AUI; Wanberg et al. 1977) assessed drinking in relation to negative mood states: Anxious Concern About Drinking, Drink to Manage Mood, and Guilt and Worry Associated With Drinking. Outpatient women consistently reported more negative affect associated with drinking than did men; significant differences were obtained for all three relevant AUI scales.

The results were mixed for the Role Demands domain. In terms of item indicators, female clients reported more childcare responsibilities than did their male counterparts (37 versus 32 percent), and they were less likely than men to report living with a spouse (26 versus 32 percent). Neither difference, however, was statistically significant. There were also no gender differences on the Social Role Performance scale of the Psychosocial Functioning Inventory (Feragne et al. 1983). On the other hand, females in the outpatient study reported receiving significantly less Family Social Support, and they were significantly more likely than men to attribute their alcohol use to marital difficulties on the AUI scale, Drink to Deal With Marital Problems.

Results were more consistent with predictions in the Psychopathology/Emotional Problems domain. As indicated in prior research, affective disorders were more prevalent among females than males, whereas men were more likely to receive an ASP diagnosis. Women also scored significantly higher on the ASI Psychiatric Severity scale and on the Beck Depression Inventory (BDI; Beck et al. 1961).

Although no measure of self-esteem per se was included in the assessment battery, gender differences on instruments reflecting self-esteem/instrumentality were all consistent with expectations. Women scored lower than men in instrumentality ("masculinity") on the Personal Attributes Questionnaire (PAQ; Spence et al. 1974) and higher on expressiveness ("femininity") as well as on the Assertion of Autonomy scale of the Interpersonal Dependency Inventory (Hirschfeld et al. 1977). In addition, they

Table 3. Baseline gender differences in treatment need domains by study arm—Mean (SD)

Intake variable	Outpatient arm			Aftercare arm		
	Males	Females	p	Males	Females	p
External stressors/negative mood						
Anxious Concern About Drinking (AUI)	13.1 (4.9)	15.0 (4.7)	.000	14.9 (4.6)	15.9 (4.5)	.026
Drink to Manage Mood (AUI)	4.9 (2.3)	5.7 (2.1)	.000	5.5 (2.1)	6.0 (1.8)	.015
Guilt and Worry Associated With Drinking (AUI)	5.6 (2.3)	6.1 (2.1)	.001	6.3 (2.2)	6.5 (2.1)	.454
Role demands						
Social Role Performance (PFI)	3.5 (.77)	3.5 (.79)	.278	3.3 (.93)	3.3 (.88)	.452
Family Social Support	4.3 (2.3)	3.6 (2.6)	.000	4.2 (2.4)	4.2 (2.5)	.407
Drink to Deal with Marital Problems (AUI)	1.9 (2.0)	2.6 (2.2)	.003	2.2 (2.0)	3.0 (2.2)	.005
Psychopathology/emotional problems						
Psychiatric Severity Scale (ASI)	.19 (.19)	.22 (.20)	.052	.21 (.20)	.32 (.24)	.000
Beck Depression Inventory	9.3 (7.7)	11.6 (8.8)	.001	10.2 (8.1)	12.4 (10.0)	.013
Self-esteem/instrumentality						
Instrumentality (MASC–PAQ)	28.4 (5.1)	26.1 (5.4)	.000	27.9 (5.3)	24.6 (5.4)	.000
Expressiveness (FEM–PAQ)	30.0 (4.5)	32.1 (4.3)	.000	29.9 (5.0)	32.6 (4.6)	.000
Masculinity-Feminity (PAQ)	24.7 (3.8)	27.7 (4.5)	.000	25.2 (4.0)	29.4 (3.7)	.000
Alcohol Self-Efficacy	3.0 (.81)	2.8 (.76)	.036	3.2 (1.0)	3.2 (1.0)	.366
Interpersonal Dependency	40.4 (7.0)	41.9 (6.9)	.005	40.4 (7.0)	43.2 (7.6)	.000

NOTE: AUI=Alcohol Use Inventory; ASI=Addiction Severity Index; PAQ=Personal Attributes Questionnaire; PFI= Psychosocial Functioning Inventory. One-tailed t-tests were used to test for between-group differences.

reported significantly lower levels of alcohol self-efficacy (DiClemente et al. 1994).

In summary, significant gender differences were obtained for 17 of 20 intake assessment variables that span 4 relevant treatment need domains. These differences indicate that the treatment needs of outpatient women tended to differ from those of male clients, and they provide confirmation for the first prediction derived from the gender matching hypothesis causal chain.

Did CBT and TSF treatment delivery differ as anticipated? The Project MATCH therapies have been shown to be discriminable in terms of critical ingredients (Carroll et al. 1998). For purposes of investigating the causal chain, however, it is also important to show that males and females received sufficient exposure to the two treatments and that the specific elements hypothesized to affect outcomes were present in

CBT and TSF. To begin to address this issue, session attendance rates within the two treatments were compared in a 2 (Gender) × 2 (Treatment condition) ANOVA. No significant main effects were found, and there were no sex differences in session attendance rates as a function of treatment assignment. On average, outpatient CBT males attended 8.28 therapy meetings and females completed 8.25 sessions; comparable values for TSF were 7.49 and 7.46.

Next, exposure to particular treatment elements was examined. In terms of CBT, sex differences in the session content (as recorded by the therapist) of each CBT session were examined. Two types of measures were evaluated: (1) session topics and (2) therapist ratings of the degree to which the sessions emphasized problem-solving and coping skills. Session topics were considered separately for core and elective

therapy sessions. The former focus more specifically on drinking (e.g., drink-refusal skills) and were intended for all CBT participants, whereas the elective sessions were designed to cover problems that were of particular relevance to individual clients (e.g., anger management).

The second type of measure, therapist session ratings, was designed to assess the type of activity that took place, independent of the specific topic (e.g., apply a problem-solving strategy). It should be noted that, although these treatment process data provide important clues as to what occurred in therapy, there is considerable missing data on these measures, with the analyses at week 12 examining only 25 percent of the outpatient sample. (Consistent with the treatment attendance data, the relative proportions of males and females approximate those for the outpatient sample more generally across the various sessions.) In addition, the responses represent only the therapists' (and not the clients') perceptions.

Table 4 indicates, for treatment sessions #2 through #12, the extent to which the elements of CBT specified in the causal chain were primary topics in therapy. The first indicator, core sessions, sums across two topics—problem-solving and drink-refusal skills; the second indicator, elective sessions, includes three topics—introduction to assertiveness, managing negative thinking, and managing negative moods.

Overall, core therapy sessions accounted for 78 percent of the outpatient sessions included in table 4. Core therapy sessions pertinent to the causal chain occurred most often during relatively early sessions of treatment, specifically sessions #4 through #7. However, for a notable minority of men, these topics were covered in later sessions. Elective sessions dealing with assertiveness and negative thinking or moods tended to occur later in the treatment phase, and they were more prevalent for women clients.

In addition to a summary of session topics, table 4 presents mean therapist ratings of the

Table 4. CBT checklist therapist reports: Outpatient arm

Session (n)	CBT session topics				Therapist session ratings	
	Core sessions: Problem-solving and drink-refusal skills (%)		Elective sessions: Assertiveness and mood management (%)		Problem-Solving and Coping-Skills Index Mean (SD)[a]	
	Males	Females	Males	Females	Males	Females
2 (268)	2.6	.0	.5	.0	3.58 (.58)	3.73 (.54)
3 (256)	9.2	4.6	.0	.0	**3.55 (.60)**	**3.71 (.61)**
4 (234)	62.3	76.1	1.8	1.6	3.69 (.64)	3.82 (.65)
5 (223)	56.0	61.0	1.2	2.3	**3.52 (.71)**	**3.78 (.62)**
6 (219)	26.7	26.6	.7	6.7	3.52 (.72)	3.71 (.58)
7 (204)	15.7	21.4	1.4	1.8	3.50 (.68)	3.66 (.64)
8 (191)	5.3	15.1	12.1	14.2	3.42 (.75)	3.47 (.62)
9 (164)	8.4	2.0	16.0	22.0	3.37 (.75)	3.40 (.74)
10 (160)	6.3	.0	15.3	35.7	**3.30 (.70)**	**3.57 (.67)**
11 (133)	4.3	.0	16.2	24.3	3.33 (.77)	3.30 (.76)
12 (83)	.0	.0	1.6	.0	3.25 (.80)	3.06 (.87)

[a] The Problem-Solving and Coping-Skills index represents the mean rating using a response scale ranging from 1 ("not at all") to 5 ("extensively") across four items: (1) discussion of high-risk situations in terms of coping skills used; (2) therapist attempts to "teach, model, rehearse, review, or discuss specific skills"; (3) application of a problem-solving strategy; and (4) formulation of coping strategies to anticipate high-risk situations.

NOTE: Bold entries for therapist session ratings indicate significant gender differences, two-tailed t-test, $p < .05$.

extent to which problem-solving and coping skills were emphasized during the session. The index presented is based on four separate ratings:

- Discussion of high-risk situations in terms of coping skills used

- Therapist attempts to "teach, model, rehearse, review, or discuss specific skills"

- Application of a problem-solving strategy

- Formulation of coping strategies to anticipate high-risk situations

Ratings were made using a 5-point scale ranging from 1="not at all" to 5="extensively." Regardless of the specific session topic, therapists tended to report more emphasis on problem-solving/coping skills with female than with male clients, but the differences tended to be small and not statistically significant.

The patterns in table 4 suggest that CBT treatment delivery for both sexes involved the elements specified in figure 1. Moreover, these elements were more likely to be present for female than for male clients, presumably because of their greater relevance. However, the percentages in table 4 suggest that many women for whom data are available did not receive elective sessions dealing with the targeted issues. And, because the elective session topics were more often dealt with during the later weeks of treatment, many participants had ceased attending therapy (recall the mean number of sessions attended for both sexes was approximately eight). Therapist ratings present a similar picture. Problem-solving and coping skills were emphasized for clients of both sexes, and, in absolute terms, the ratings tend to average only somewhat above the midpoint of the 5-point rating scale. Thus, it is questionable whether female participants received adequate exposure to the critical ingredients of CBT specified by the hypothesis.

With respect to TSF, the gender matching hypothesis suggests that female clients may find AA meetings both uncomfortable and counterproductive in terms of their specific treatment needs. Table 5 presents a summary of male and female attendance rates at self-help meetings.

Table 5.—Gender differences in AA meeting attendance during the followup period

Time	Cognitive-Behavioral Therapy		Twelve Step Facilitation	
	Males	Females	Males	Females
Outpatient arm				
3 months	.04	.04	.21	.23
6 months	.05	.05	.13	.12
9 months	.05	.05	.11	.13
12 months	.06	.05	.10	.10
15 months	.07	.05	.10	.08
Aftercare arm				
3 months	.29	.26	.40	.43
6 months*	.21	.16	.25	.37
9 months*	.20	.13	.19	.32
12 months*	.17	.12	.18	.30
15 months*	.16	.11	.19	.40

NOTE: Cell entries represent the mean proportion of days that clients reported attending meetings during each followup time window as assessed via the Form 90 interview.

*t-tests indicate significant ($p < 0.05$, two-tailed) gender differences for those in the TSF condition at these time points.

This measure, derived from Form 90 (Miller 1996) interviews, represents the mean percentage of days within each 3-month followup period that meetings were attended. As shown, male and female clients reported comparable levels of meeting attendance. Both sexes were more likely to attend meetings in the TSF condition than in CBT. And, while attendance remained relatively stable in CBT, it tended to decline somewhat over time in TSF.

To assess differences in active participation in AA, female and male scores on the followup version of the Alcoholics Anonymous Involvement scale (Tonigan et al. 1996) were compared. No differences were found at any of the time points tested (3, 9, and 15 months following treatment initiation), suggesting that meeting-attendance rates do not mask underlying differences in involvement in AA.

Did the two treatments differentially affect the intervening variables? Is the gender matching hypothesis supported for those intervening outcomes that are differentially targeted by CBT and TSF? Four of the baseline measures used to establish sex differences at intake were repeated at 6-month intervals during the followup phase of the trial. Repeated-measures ANOVAs were performed using gender and treatment condition as between-clients factors and scores on the hypothesized intervening variables at baseline and 3-, 9-, and 15-month followup points as the dependent variables. The results of these analyses failed to support this set of linkages in the causal chain. In analyses of ASI Psychiatric Severity, the Beck Depression Inventory, Alcohol Self-Efficacy, and Social Role Performance, only one significant interaction involving gender and treatment assignment was obtained, and this result was inconsistent with the predicted effect. A significant Gender × Treatment condition × Time interaction was found for Psychiatric Severity (F=4.07, df= 3,1218, p=.007). As shown in table 6, during the followup period (and particularly toward the end of the period), TSF women reported fewer psychiatric symptoms on the ASI, and greater reductions from baseline levels, than those

assigned to CBT, whereas changes for males were comparable across the two treatments.

Are the intervening variables related to drinking outcomes? Table 7 presents correlations between the intervening variable indicators and drinking measures at the end of treatment and 1 year later. Despite the considerable variation in the strength of the relationships (r's ranging from 0.01 to 0.51), all of the correlations are in the expected direction. Correlations involving the ASI tend to be weak and nonsignificant; relationships between BDI and Social Role Performance scores and drinking are larger. Not surprisingly, associations are strongest for the Alcohol Self-Efficacy scale, which is most directly related to drinking. On average, the entries in table 7 are higher for female than for male clients. Thus, although not completely consistent across measures, intervening outcome variables tend to be correlated with alcohol consumption indicators during the followup period.

In summary, causal chain analyses for the outpatient sample produced mixed results. Gender differences were found in terms of the treatment needs specified in the model, and scores on the intervening variables were correlated with drinking outcomes. However, indicators of treatment process suggested that CBT and TSF may not have been delivered and experienced as anticipated. Although more emphasis was given to general coping skills and mood management for female clients in CBT than for males, the magnitude of the difference was relatively small, and the amount of attention paid to these areas was somewhat limited. In terms of TSF, men did not attend AA meetings more often than women, and they did not evidence higher levels of AA involvement. Further, only one significant Gender × Treatment condition interaction effect was observed for the intervening outcome variables that were the direct targets of the treatments in the causal chain, and the pattern of results was opposite that predicted.

Aftercare Arm

Are hypothesized baseline gender differences present? As described above, male and female clients were compared in terms of a variety of measures of treatment need. As in the outpatient study, aftercare women were significantly

Table 6.—ASI Psychiatric Severity Scale Gender × Treatment interaction effect: Outpatient sample — Mean (SD)

Time	Cognitive-Behavioral Therapy		Twelve Step Facilitation	
	Males (n=168)	Females (n=74)	Males (n=183)	Females (n=79)
Baseline	.20	.23	.19	.21
	(.20)	(.21)	(.19)	(.20)
3 months	.14	.17	.12	.14
	(.17)	(.21)	(.17)	(.17)
9 months	.13	.15	.11	.13
	(.18)	(.21)	(.16)	(.16)
15 months	.09	.18	.09	.11
	(.16)	(.22)	(.15)	(.16)

Gender × Time: F=2.82; df=3,404; p=.039.
Gender × Treatment Assignment × Time: F=4.07; df=3, 1218; p=.007.

Table 7.—Correlations between hypothesized intervening variables and drinking outcomes

Variables	Males				Females			
	PDA[4]	PDA[15]	DDD[4]	DDD[15]	PDA[4]	PDA[15]	DDD[4]	DDD[15]
Outpatient arm								
Social Role Performance	.20	.20	-.22	-.28	.26	.21	-.36	-.25
ASI Psychiatric Severity	-.08	-.01	.13	.09	-.05	-.15	.08	.26
Beck Depression Inventory	-.16	-.24	.14	.27	-.36	-.25	.32	.40
Alcohol Self-Efficacy	.39	.42	-.33	-.35	.50	.51	-.50	-.47
Aftercare arm								
Social Role Performance	.17	.27	-.25	-.37	.20	.19	-.19	-.42
ASI Psychiatric Severity	-.08	-.14	.10	.29	-.18	-.28	.12	.36
Beck Depression Inventory	-.29	-.38	.28	.47	-.36	-.30	.26	.46
Alcohol Self-Efficacy	.35	.45	-.34	-.47	.30	.48	-.30	-.49

Entries are Pearson product moment correlations between intervening variables and drinking outcomes that correspond in terms of followup time point. PDA[4] and PDA[15] refer to percentage of days abstinent at the 4- and 15-month time points, respectively; DDD[4] and DDD[15] represent drinks per drinking day at these same points. All entries are statistically significant ($p < .05$) except for those underscored.

less likely to be employed than men (41 versus 48 percent), and they were more likely to report a history of physical or sexual abuse (68 versus 30 percent). As shown in table 3, significant differences in the predicted direction were obtained for two of the three AUI scales in this domain, Anxious Concern About Drinking and Drink to Manage Mood.

As in the outpatient study, mixed results were obtained for measures in the role demands domain. Female clients were significantly more likely to report childcare responsibility than were males (36 versus 24 percent); they were also less likely to report living with a spouse (31 versus 38 percent), but this association did not achieve statistical significance. As shown in table 3, no sex differences were found for the Social Role Performance or Family Social Support scales, although aftercare women scored significantly higher than men on the AUI scale, Drink to Deal With Marital Problems.

Predicted differences were also found for the psychopathology/emotional problems domain. As in the outpatient sample, aftercare females were more often diagnosed with affective disorders, and males with ASP. Women scored significantly higher on the ASI Psychiatric Severity scale and on the Beck Depression Inventory (see table 3).

In terms of self-esteem/instrumentality, aftercare women scored lower than men on the PAQ Instrumentality ("masculinity") scale and higher on Expressiveness ("femininity") and Interpersonal Dependency. No differences, however, were found for Alcohol Self-Efficacy.

In sum, the aftercare results roughly paralleled those for the outpatient sample. Predictions were confirmed for 15 of 20 variables across the four treatment need domains. The profiles for aftercare clients of both sexes were consistently higher in problem severity than those for the outpatient sample. The gender differences found in these analyses indicated that women and men have different needs in areas that should be differentially addressed by the study treatments, and that these needs were more marked in the aftercare sample.

Did CBT and TSF treatment delivery differ as anticipated? As with the outpatient sample, the examination of this question began with an analysis of treatment compliance rates. Again, a 2 (Gender) × 2 (Treatment condition) ANOVA was performed. No gender differences were found as a function of treatment assignment.

Aftercare CBT males attended, on average, 8.08 therapy meetings compared with 7.81 sessions for women. TSF attendance rates were also similar for males and females (7.32 and 7.23, respectively).

Next, therapists' descriptions of CBT session content and ratings of the extent to which problem-solving and coping skills were emphasized were examined. Results for the aftercare study are presented in table 8. As noted above, these data should be viewed cautiously, especially during the late weeks of treatment (for Week 12, data are available for only 43 percent of participants). As in the outpatient arm, across sessions the relative proportions of each gender approximate those for the entire aftercare sample.

The pattern for the aftercare sample is similar to that for the outpatient arm. For both genders, there was more focus on problem-solving and coping skills during the core treatment sessions, which accounted for 76 percent of those included in table 8. In general, the same

conclusions and caveats apply. Elements of CBT specified in the causal chain were clearly evident in treatment; however, the incompleteness of the data, coupled with the occurrence of elective elements relatively late in the treatment phase, raise questions regarding adequacy of exposure.

Table 5 summarizes aftercare male and female attendance rates at self-help meetings. Compared with the outpatient study, higher rates were exhibited by both men and women in the aftercare arm for both CBT and TSF. In fact, attendance was higher for aftercare CBT clients than it was for TSF outpatients. Contrary to the hypothesis, women in the TSF condition reported significantly higher rates of meeting attendance than did men for all posttreatment followup periods. Aftercare women in TSF also had higher AA Involvement scores at the 3-, 9-, and 15-month followup points, but the difference only reached statistical significance at the last evaluation (M=3.03, SD=1.94 for males,

Table 8.—CBT checklist therapist reports: Aftercare arm

| | CBT session topics | | | | Therapist session ratings | |
| | Core sessions: Problem-solving and drink-refusal skills (%) | | Elective sessions: Assertiveness and mood management (%) | | Problem-Solving and Coping-Skills Index Mean (SD)[a] | |
Session (n)	Males	Females	Males	Females	Males	Females
2 (226)	1.7	0	0	0	3.50 (.62)	3.46 (.57)
3 (206)	4.4	2.1	0	0	3.51 (.57)	3.46 (.51)
4 (189)	76.6	81.8	.1	0	3.79 (.59)	3.65 (.46)
5 (180)	67.9	81.4	.7	0	3.63 (.63)	3.67 (.56)
6 (175)	16.9	29.3	.7	0	3.58 (.71)	3.62 (.61)
7 (170)	11.5	20.0	3.8	0	3.53 (.69)	3.54 (.62)
8 (159)	6.4	5.7	15.3	17.2	3.42 (.76)	3.50 (.62)
9 (153)	7.6	2.9	16.1	17.2	3.46 (.67)	3.47 (.67)
10 (145)	7.2	0	23.2	27.2	3.43 (.80)	3.55 (.69)
11 (135)	5.7	3.4	18.0	41.3	3.39 (.72)	3.43 (.68)
12 (116)	0	0	1.1	3.6	3.22 (.89)	3.19 (.84)

[a] The Problem-Solving and Coping-Skills index represents the mean rating using a response scale ranging from 1 ("not at all") to 5 ("extensively") across four items: (1) discussion of high-risk situations in terms of coping skills used; (2) therapist attempts to "teach, model, rehearse, review, or discuss specific skills"; (3) application of a problem-solving strategy; and (4) formulation of coping strategies to anticipate high-risk situations.

and M=3.88, SD=1.90 for females; t=-2.45, df= 216; p=.015).

Did the two treatments differentially affect the intervening variables as predicted? Repeated measures ANOVAs were run using Gender and Treatment condition as between-clients factors and scores on the hypothesized intervening variables (Social Role Performance, ASI Psychiatric Severity, Beck Depression Inventory, and Alcohol Self-Efficacy) at baseline and 3-, 9-, and 15-month followup points as the dependent variables. Again, the results did not support this pathway in the causal chain.

Are the intervening variables related to drinking outcomes? As table 7 shows, the overall pattern of correlations between intervening variables and drinking outcome measures at the end of treatment and 1 year later at the 15-month followup point was similar to that obtained for the outpatient study. In general, the correlations tended to be slightly higher for the aftercare sample.

Thus, although there was considerable variability in the magnitude of the associations (r's ranging from 0.08 to 0.49), the results tended to support this link in the causal chain. For both sexes, scores on variables such as Social Role Performance, Psychiatric Severity, Depression, and Alcohol Self-Efficacy were associated with both the frequency (PDA) and quantity (DDD) of drinking during followup.

In summary, results of the causal chain analyses for the aftercare arm were similar to those obtained for the outpatient sample. Gender differences in treatment needs were documented, and scores on the intervening variables were associated with alcohol consumption measures. However, treatment process data analyses suggested that CBT and TSF were not experienced as predicted. As in the outpatient arm, the emphasis placed on general coping skills and mood management in CBT sessions for female clients was relatively limited. Contrary to predictions, aftercare women attended AA meetings more often than did their male counterparts, and they reported stronger AA involvement during the followup period. Further, no Gender × Treatment condition interactions were found for the intervening outcome variables targeted by the treatments in the causal chain.

Discussion

The direct tests of the gender matching hypothesis failed to support the formulation presented above. Evidence in support of the hypothesis was not obtained in either arm of the trial or in either timeframe under study. Analyses aimed at determining where the hypothesized causal chain "broke down" indicated that some linkages were consistent with the formulation and that other pathways may require reconsideration.

The hypothesized differential treatment needs for males and females were evidenced by baseline gender differences in four treatment need domains: external stressors/negative mood, role demands, psychopathology/emotional problems, and self-esteem/instrumentality. At the other end of the causal sequence, analyses indicated that scores on the intervening variables specified in the formulation were related to drinking outcomes. Thus, the causal chain depicted in figure 1 appears most problematic in terms of differential therapeutic content and gender differences in response to treatment. CBT appeared to address the specific problems and treatment needs of female clients in only a limited fashion. Topics covered in therapy appear not to have been those expected to be of most concern to the women in the trial.

The failure of CBT to address fully the identified treatment needs of women in Project MATCH may reflect the manner in which the treatment was implemented in the trial rather than factors intrinsic to the therapy itself (cf. Donovan 1998). A hallmark of cognitive-behavioral approaches is a functional analysis of the client's drinking behavior. To distinguish CBT from Motivational Enhancement Therapy, this analysis was not performed in Project MATCH, nor were results of the comprehensive baseline assessment made known to CBT therapists. Further, both the individual format and the specified content and pace of the treatment sessions (eight core sessions, a different topic each week) may have impeded skill acquisition. Group sessions permit more modeling, role playing, and behavioral rehearsal of new skills; the content and pace requirements for the treatment reduced the number of elective sessions

pertinent to the specific treatment needs of women that took place. More flexibility in the manual-guided treatment may have produced different results (Donovan 1998).

Perhaps more importantly, the discomfort hypothesized to occur for female clients in the TSF condition was not evident. In terms of session attendance, females were equally compliant in CBT and TSF, and, in the TSF condition, they evidenced higher AA/12-step meeting attendance rates than did male clients in the aftercare study, the arm of the trial in which women had more favorable outcomes than men. This contradiction of the hypothesis formulation may, however, be more apparent than real. The extent to which the meetings attended by women in the trial conform to the traditional view of AA as confrontational and male dominated is not known. AA has become quite diverse in terms of its offerings (McCrady and Delaney 1995), and it may be that women in the trial participated in meetings that did not have, and possibly explicitly rejected, formats and norms that might be construed as hostile toward women or intolerant of female self-assertion. Further, such AA groups may have provided female clients, many of whom were socially isolated, with the means for building a social support network (McCrady and Raytek 1993).

The improvements in response to treatment suggest that both CBT and TSF succeeded in addressing many of the needs of clients of both genders. CBT might have had more impact if more time and attention were specifically devoted to those problems that are more prevalent among women. On the other hand, some of the problems themselves may be as much a consequence of drinking as a cause. This argument has been applied to understanding the negative affect and psychopathology frequently reported by alcoholics (e.g., Schuckit and Hesselbrock 1994; Verheul et al. 2000). To the extent that this is the case, one might expect that sobriety achieved in either treatment would have at least some beneficial effect in the other problem domains.

Finally, the findings do not rule out the possibility that gender-treatment matching may improve outcomes when other treatment factors are considered. "Gender-specific" treatments are usually defined less in terms of general therapeutic philosophy or modality and more in terms of factors that relate to ease of communication (e.g., female therapist, group sessions with other female participants) and content (special attention to specific issues such as sexual and physical abuse, reproductive problems). Such factors were not examined in the present study, and there is some evidence that they can produce superior treatment outcomes (Dahlgren and Willander 1989).

Acknowledgments

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