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What explains the relationship between the Therapist Structure X Patient Reactance interaction and drinking outcome? An examination of potential mediators

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Abstract

Recent research found that among patients in aftercare treatment for alcoholism the level of therapist structure interacted with the level of patients' interpersonal reactance to predict alcohol use outcomes. The present study examined 2 sets of potential mediators of this interaction effect among a sample from 2 aftercare sites of Project MATCH ($n = 127$). The mediator constructs were types of pro-recovery change talk and resistance to therapeutic work. Dependent variables were percentage of days abstinent (PDA) and percentage of heavy drinking days (PHDD) across the year after treatment. Multiple-mediator models using bootstrapped estimates of indirect effects were used to test for mediation. Results indicated that the 'taking steps' aspect of change talk partially mediated the Structure X Reactance interaction effect on both PDA and PHDD post treatment. Resistance was not found to mediate the interaction effect though resistance did predict worse drinking outcomes. Depending on patients' openness to being influenced by others, therapist structure early in treatment may promote or inhibit pro-recovery steps taken by aftercare patients between treatment sessions. Those steps in turn play an important role in predicting future alcohol use.

Keywords

alcohol; treatment; reactance; structure; change talk; mediation

Efforts to identify behavioral treatments for alcoholism that are differentially effective for specific subgroups of patients have yielded few results (UKATT Research Team, 2008; Project MATCH Research Group, 1997a, 1997b). The limited findings from the Project MATCH and UKATT studies are especially notable given that they collectively examined 4 distinct treatments and over 20 patient attributes purported to influence differential response to treatment.

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Contrary to the paucity of evidence for differential matching effects for different treatment modalities, research focusing on differential outcomes as a function of therapist factors, irrespective of treatment modality, has been more revealing. Therapists' personal attributes have been shown to be associated with alcohol treatment outcome (Project MATCH, 1998), in-session therapist behaviors have been shown to predict in-session patient behaviors (e.g., Gaume, Gmel, Faouzi, & Daeppen, 2008; Moyers et al., 2007), and in-session patient behaviors have been shown to relate to drinking outcomes (e.g., Moyers et al., 2009; Amrhein et al., 2003; Gaume, Gmel, & Daeppen, 2008). In surveying the general psychotherapy literature, Wampold has concluded that therapist factors likely contribute far more to psychotherapy outcomes than do differences between treatment modalities (Wampold, 2001).

Our own prior research has suggested that in-session therapist behaviors, when matched to specific patient characteristics, can have clinically significant effects on patients' post-treatment alcohol use outcomes (Karno, Beutler & Harwood, 2002; Karno & Longabaugh, 2003, 2004). Among these effects, the one which we have examined most fully is the differential outcomes experienced by aftercare patients as a function of the interaction of their trait reactance (i.e., reluctance to be influenced by others) with the amount of structure provided by the therapist during each session (Karno & Longabaugh, 2005a, 2005b). For patients high in reactance, increased levels of therapist structure were associated with worse drinking outcomes in the year following treatment. In contrast, patients low in trait reactance were less affected by the amount of structure in their therapy. To the extent that structure made a difference for them, more structure tended to produce better drinking outcomes. These findings have now been replicated on a second aftercare sample (Karno, Longabaugh & Herbeck, 2009).

The replication of the interaction between therapist structure and patient reactance has led us to address a key question: What are the mechanisms by which this matching effect occurred? The focus of this question parallels recent shifts in research that are occurring in the general behavior therapy literature (Kazdin & Nock, 2003) and in the alcohol-specific treatment literature (e.g., Apodaca & Longabaugh, 2009; Longabaugh et al., 2005) to identify factors that are responsible for therapeutic success.

To answer this question one needs to identify patient-level mechanisms that meet two conditions: 1) they are predictive of future alcohol use outcomes, and 2) they are themselves affected by the interaction of therapist structuring behaviors and patient reactance. Review of the general psychotherapy and alcohol behavioral therapy research literature suggested at least two potential patient-level mechanisms that plausibly may meet these criteria: patients' resistance to the therapeutic process and patients' use of pro-recovery language.

Resistance has been conceptualized as opposition to the therapeutic process as manifest by opposition to painful affect, change, insight, recollection of therapeutic material, and the therapist (Mahalik, 1994). The construct of resistance has historically been viewed as playing an important role across treatment modalities including cognitive-behavioral (Goldfried, 1982) and rational-emotive (Ellis, 1985) therapies. In alcohol treatment, resistance has been associated with poor outcomes (Miller, Benefield, & Tonigan, 1993). This finding supported the first condition that resistance be associated with alcohol use outcomes. In an empirical examination of in-session resistance, Mahalik (1994) found that resistance increased after therapists provided information or asked closed-ended questions. That study did not examine the effects of those therapist behaviors across levels of reactance, but it did provide support that therapist structuring behaviors were associated with patient in-session resistance. Thus although empirical data to support or refute the effect of the Structure X Reactance interaction on patient resistance is not available, the relationship

of therapist behaviors to in-session resistance may suggest that it is plausible for resistance to be affected by the Structure X Reactance interaction.

Another potential mechanism is the patient's use of pro-recovery language (e.g., Moyers et al., 2007; Apodaca & Longabaugh, 2009). So called "change talk" is a purported mechanism of motivation-based interventions and has been shown to be associated with positive substance use outcomes (Strang & McCambridge, 2004; Amrhein et al., 2003; Moyers et al., 2009). These findings support the first condition that the potential mechanism be associated with alcohol use outcomes. Research has not examined whether change talk is impacted by the Structure X Reactance interaction effect, yet given that more therapist-directed interventions have been associated with less change talk (Moyers et al., 2007), we believe it is plausible that the effect of therapist interventions on patient change talk will be moderated by level of patient trait reactance.

Based on the extant literature, the hypotheses of the present study were that in-session resistance and change talk would mediate the Structure X Reactance effect on post treatment alcohol use. We hypothesized that increased change talk in therapy would be predictive of better drinking outcomes while resistance to the therapy process would be predictive of worse post-treatment drinking outcomes. Unique to our formulation was that each of these potential mediators would themselves be affected by the Structure X Reactance interaction. Building on our previous research that observed increased levels of therapist structure to be associated with worse drinking outcomes among patients high in reactance but not among patients low in reactance (Karno & Longabaugh, 2005b; Karno, Longabaugh & Herbeck, 2009), the present study hypothesized that therapist structure would differentially affect levels of in-session resistance and change talk across patients low and high in reactance. The expected direction of these effects was that for high reactance patients increased levels of structure would inhibit the therapeutic process in that they would be associated with less change talk and higher resistance to therapy. For low reactance patients, increased therapist structure was expected to facilitate the therapeutic process in that it would be associated with more change talk and less resistance to the therapy process.

Methods

Participants

The sample ($N = 127$) comprised participants from the Houston and Providence aftercare clinical research units (CRU) from the Project MATCH clinical trial. All participants from the Providence site, and a random sample of participants from the Houston site were selected for this study. All participants met criteria for an alcohol use disorder according to DSM-III-R criteria (American Psychiatric Association, 1987). For the present study, inclusion criteria were attendance in at least two treatment sessions, no alcohol use during the first week of treatment, scores on the trait reactance scale in the low and high range as described below, and a minimum of 240 days (out of a possible one year) of post-treatment follow-up data on alcohol use. All Project MATCH participants were randomly assigned to attend 12 sessions of cognitive behavioral therapy (CBT) or twelve-step facilitation therapy (TSF), or four sessions of motivational enhancement therapy (MET). Participants included in these analyses assigned to the CBT treatment modality attended an average of 9.4 treatment sessions ($SD=3.8$); those assigned to MET attended an average of 3.8 sessions ($SD=0.7$); and those assigned to TSF attended an average of 9.6 sessions ($SD=3.5$).

Demographic characteristics—The sample was 28.6% women, 83.5% white, 8.7% African American, 7.1% Hispanic, and had an average age of 43.5 years ($SD=12.2$). About half (45.7%) were married or cohabitating.

Drinking levels prior to and during treatment—On average, this sample reported 30% days abstinent ($SD = .31$) in the 90 days prior to the intensive treatment that preceded Project MATCH, with 67% heavy drinking days ($SD = 0.31$). Consistent with National Institute on Alcohol Abuse and Alcoholism guidelines (Allen, 2003), a heavy drinking day for men was defined as a day in which five or more standard drinks were consumed. For women, a heavy drinking day was defined as a day during which four or more standard drinks were consumed. Although the sample was abstinent at treatment initiation, 35% drank alcohol on one or more days in the second through twelfth week of treatment.

Design Considerations

In our aftercare sample we observed that nearly all of the patients ($> 90\%$) had achieved a period of abstinence immediately prior to beginning aftercare treatment and maintained abstinence through at least the first week in the treatment window. This observation is consistent with the idea that the primary function of aftercare is to help patients during a high-risk period maintain the sobriety they have already achieved (McKay, 2001). We therefore included in our sample only those who had successfully completed their intensive program and were abstinent at the beginning of aftercare treatment.

Videotaped therapy sessions of the Project MATCH treatments were the source material for the ratings of therapist structure, patient reactance and mediator variables. Ratings of the mediator variables were conducted specifically for the present study. The design of the study preserved the necessary temporal relations between the independent variable (the Structure X Reactance interaction), the hypothesized mediators (in-session resistance and change talk) and re-initiation of drinking. Patient trait reactance and the amount of structure initiated by the therapist were measured during the first session. For those patients who drank during treatment, the mediator variables were measured in the session that immediately preceded each patient's resumption of drinking (second session or later). For those patients who did not drink during treatment, the mediator variables were measured from a session that was matched to the selected session for a randomly chosen patient who had drunk during treatment. Because MET had only 4 sessions, the matched sessions for participants who received MET were based on randomly selected cases who also received MET. The raters were unaware of whether a selected session preceded drinking or was a matched session for a patient who did not drink.

Drinking was measured for the year following scheduled treatment completion (i.e. the year following the 12-week treatment window). In order to control for patient predisposition to engage in hypothesized behaviors, change talk and resistance were also measured during the first therapy session. Those ratings were included as covariates in the data analysis models.

Selection and training of videotape raters

Raters were required to hold a master's degree or equivalent in a mental health field or to be a doctoral candidate if no master's degree had been awarded. A pool of fourteen raters (ten women) was selected. Raters participated in a 4-month training that incorporated lectures, group discussions, a series of practice ratings, refinement of decision rules and feedback. All raters achieved a priori criterion levels of interrater reliability and exact item agreement for each rating scale before being approved to conduct ratings for the main study.

Independent variable

Therapist structure—Therapist structure was measured using the Therapy Process Rating Scale (Fisher et al., 1995). Independent raters responded to two 5-point Likert-scale items after viewing a segment of treatment on videotape. Segments were approximately 20 minutes in length and the modal number of segments for the first treatment session was 4.

By design, the raters assigned to rate structure for a given case were never the same raters that had rated reactance for that case. The 2 structure items assessed the extent to which the therapist provided information or instruction to the patient and the extent to which the therapist introduced topics or initiated a change in topics. Scores across all rated segments of the first therapy session were averaged to obtain a single indicator of therapist structure. Scores ranged from 1.94 to 4.50, with a mean of 3.41 ($SD = .53$). The average intraclass correlation for the 2-item structure measure was $> .80$.

Therapist structure in session 1 was a good proxy for structure overall. Structure in session 1 correlated well with structure ratings averaged across multiple treatment sessions in our larger dataset ($r = .67$).

Moderator variable

Trait Psychological Reactance—Psychological reactance was measured via observer ratings using the 25-item Trait Reactance Scale from the Systematic Treatment Selection Clinician Rating Form (Fisher et al., 1999). These ratings were conducted based on observing the entire first treatment session. Two observers independently rated each patient and the total score was averaged across the observers. This measure examines the extent to which patients are reluctant to relinquish control in interpersonal situations. Examples of items include “usually follows the advice of others” and “is happiest when he or she is in charge.” In the present sample, interrater reliability was fair as indicated by an average intraclass correlation = .55 and average exact agreement by observers on 71% of the items. This level of interrater reliability was not dissimilar to the validation study for this scale (Fisher et al., 1999) that reported rater agreement on 80% of items on average among a pool of experienced Ph.D.-level clinicians who conducted their ratings after viewing a formal intake session and intake assessments. Raters for the current study had less clinical experience (newly degreed master’s or doctorate) and based ratings only on the first treatment session.

Patients were initially categorized into low, medium, and high reactance groups using cut-off scores derived from all available ratings on outpatient and aftercare participants. The total sample was divided into thirds to yield cut-off scores for the low reactance group (score < 3.25), the medium reactance group (score between 3.25 and 6.0), and the high reactance group (score > 6.0). A categorical variable was created to facilitate interpretation of statistical interaction terms (in particular because the therapist structure variable was treated as a continuous score) and to provide clinical guidelines that can be more readily translated into practice. Study participants who scored in the medium range on the scale were not included in the present study because the association between therapist structure and alcohol use among this group has been inconsistent across previous studies. Earlier research observed a negative (i.e., detrimental) relationship between structure and alcohol use (Karno & Longabaugh, 2005b) while a subsequent replication study observed no such relationship (Karno, Longabaugh & Herbeck, 2009).

Approximately half of the selected sample scored in the low range on the reactance scale (48.8%, $n = 62$), and the remaining (51.2%, $n = 65$) scored in the high range. There were no statistically significant differences between reactance groups related to sociodemographics (gender $p = .17$; age $p = .74$, ethnicity $p = .25$, and education $p = .77$), pre-treatment alcohol use ($p = .30$), pre-treatment heavy alcohol use ($p = .29$), clinical or treatment assignment ($p = .18$). Additionally, clinical variables (alcohol involvement, alcohol symptom count, psychopathology, and alcohol-specific social support) were examined across reactance groups and no differences were observed (p 's $> .46$).

Mediator variables

After viewing a segment of treatment on videotape, independent observers rated patients' in-session change talk and resistance, as described below. Scores across all rated segments of the first therapy session were averaged to obtain a single indicator of each measure for use as a covariate. Observers then viewed a second session of treatment that was prior to alcohol use (among those who resumed drinking during treatment) and rated change talk and resistance measures at that point in treatment. Again, scores across each rated segment were averaged to obtain a single indicator for each mediator variable.

Change Talk—Four categories of speech were measured to assess pro-recovery change talk by participants. These included (1) ability to change (2) importance of change,, (3) commitment to change, and (4) taking steps to change. The ratings on ability reflected a patient's self-efficacy to successfully enact change. The ratings on importance reflected how much of a problem each patient's alcohol use was for her/him as indicated by statements regarding need to change, reasons to change and desire to change. The ratings on commitment reflected a patient's intention that they would change. The ratings on taking steps reflected specific recovery-related actions a patient did outside of treatment. For each 20-minute therapy segment, 2 independent observers provided a rating of the strongest expression of speech for each category. These strength ratings parallel Amrhein et al's (2003) ratings of strength of utterance in a given category.

In recognition that the participants were abstinent at the start of their Project MATCH treatment, raters were instructed to rate each category of pro-recovery change talk in terms of making or maintaining a change in their drinking. Categories were rated on a 4-point scale in which 0=no relevant statements (e.g., no statements pertaining to importance), 1=a qualified statement (e.g., "I kind of have to clean up my act"), 2=a straightforward statement (e.g., "I have to clean up my act"), and 3=an amplified statement (e.g., "I need very much to be sober"). Expressions of each category supporting and negating the target behavior were assessed. Expressions negating the target behavior (e.g., "drinking gives me something to do during the day") were reverse scored. Session-level ratings for each category were derived by averaging across the segment-level ratings. In the present study this coding system had excellent interrater reliability (average ICC > .9) and good internal consistency (Cronbach's alpha = .77). Bivariate correlations among the 4 indices ranged from $r = .40$ to $r = .57$.

Resistance to Therapeutic Work—Resistance by participants during therapy sessions was assessed with the Client Resistance Scale (Mahalik, 1994). The Client Resistance Scale is an observer rating scale of psychotherapy that measures patient opposition during treatment. The scale has 5, Likert-type items that measure (1) opposing expression of painful affect, (2) opposing recollection of material, (3) opposing the therapist, (4) opposing change, and (5) opposing insight. The items are scored on a seven-point scale in which higher scores indicate greater in-session client resistance. These ratings were conducted for 20-minute therapy segments which were averaged to yield a session-level rating. Interrater reliabilities for these items were originally reported to range from ICC = .72 to ICC = .93 (Mahalik, 1994). Interrater reliability for the present sample was ICC > .7. Cronbach's alpha was .87.

Dependent variables

Percentage Days Abstinent—Alcohol use frequency was assessed as the percentage of days abstinent (PDA) from alcohol during the first year after treatment. PDA for each 90-day period following treatment was measured in Project MATCH via the Form 90 (Miller, 1996). PDA was negatively skewed and an arcsine transformation was conducted to approximate a normal distribution.

Percentage Heavy Drinking Days—Heavy alcohol use frequency was assessed as the percentage of heavy drinking days (PHDD) during the year after treatment. These data were positively skewed and a square-root transformation was performed.

Data analysis

The tests for “mediated moderation” were based on estimates of multivariate path analysis using the INDIRECT macro (Preacher & Hayes, 2008) that uses ordinary least square (OLS) regression analysis. Support for total and specific indirect effects was based on $n=5,000$ bootstrapped sampling distributions of the indirect effects. Two analyses were conducted for the resistance items, one for PDA and one for PHDD as the dependent variable. In those models the independent variable was the Structure X Reactance interaction effect. Other variables entered into the model were the 5 resistance items as potential mediators, the main effects of structure and reactance (low vs. high), the session 1 ratings for each of the 5 resistance items as covariates, and treatment assignment as a covariate.

Two analyses were conducted for the change talk items, one for PDA and one for PHDD as the dependent variable. In those models the independent variable was the Structure X Reactance interaction effect. Other variables entered into the model were the 4 change talk items as potential mediators, the main effects of structure and reactance (low vs. high), the session 1 ratings for each of the 4 change talk items as covariates, and treatment assignment as a covariate.

For each analysis the significance level was set at $\alpha < .05$. All hypothesis tests were 1-tailed given that observed effects had to be in hypothesized directions to support mediation.

Completeness of data

Among an initial sample of 173 clients who scored in the low and high range of trait reactance, 12 did not have 240 days of follow up alcohol use data, 21 did not attend more than one treatment session, and 13 were not abstinent during the first week of treatment. Thus the final sample size was $n = 127$ (73.4% of the initial sample).

Results

Patient Reactance X Therapist Structure Interaction Effect

We initially examined the coefficient in the models for the effect of the interaction between patients' trait reactance and first-session therapist structure on percentage days abstinent (PDA) and percentage heavy drinking days (PHDD) in the year after treatment. These tests sought to determine that we had an observable moderator effect for which we could then identify potential mediators. While our previous research found support for this interaction when structure was measured across multiple treatment sessions, we had not previously examined the interaction effect using ratings on therapist structure only during the first treatment session. Results indicated that, while not statistically significant (PDA: $F(1,121) = 3.78, p = .054$; PHDD: $F(1,121) = 3.10, p = .08$), the nature of the interaction mirrored previous research findings and in doing so provided a reasonable proxy. MacKinnon has made the case that a main effect need not reach significance in order to test for mediation (MacKinnon, 2008). Among participants in the high reactance group increased therapist structure during the first session was associated with fewer abstinent days ($B = -0.27, SE = .08, p < .01$) and more heavy drinking days ($B = 0.21, SE = .06, p < .01$) in the year following treatment. There did not appear to be an effect of structure on post treatment PDA or PHDD among the low reactance group. This pattern of results suggested the presence of a meaningful moderator effect and thus we proceeded with the examination of potential mediators of the effect.

Change Talk Indices as Mediators of the Interaction Effect

The path coefficients from these models are presented in Figure 1. Of the four indices, only taking steps had significant paths in both parts of the model. Therapist structure differentially predicted taking steps across the low and high reactance groups ($B = 0.57$, $SE = 0.27$, $p < .05$), and in turn more taking steps was a significant predictor of greater PDA ($B = 0.11$, $SE = 0.04$, $p < .01$) and lower PHDD ($B = -0.10$, $SE = 0.03$, $p < .01$). The bootstrap results for the indirect effect indicated that there was a significant indirect effect of the Structure X Reactance interaction on alcohol use that acted through the taking steps variable [for PDA: bootstrap indirect effect = 0.06 (bias corrected 95% CI = +0.01–+0.16); for PHDD: bootstrap indirect effect = -0.06 (bias corrected 95% CI = -0.13–-0.02)]. This indirect effect accounted for 26% and 45% of the observed Structure X Reactance interaction effect on post treatment PDA and PHDD, respectively.

The nature of the relationship between the Structure X Reactance interaction and taking steps is depicted in Figure 2. The simple slopes plot suggests that increased therapist structure for patients in the low reactance group was associated with higher ratings on taking steps. For patients in the high reactance group there appeared to be an opposite relationship. Increased therapist structure for high reactance patients appeared to be related to lower ratings on taking steps. Significance tests to determine if these slopes were each different than zero supported the positive main effect of structure on taking steps for patients low in reactance ($p < .05$) and approached significance for the negative effect of structure on taking steps for patients high in reactance ($p < .10$).

For the other change talk indices of ability, importance and commitment, the data did not support the presence of an indirect effect in either the PDA or PHDD models. None of those indices had significant paths in both parts of the model, and the bootstrap results for indirect effects were not significant at the $p < .05$ level. As shown in Figure 1, it is evident that the mediation model for the ability and importance variables broke down in the path connecting them to post treatment PDA and PHDD. While the results suggested associations between the Structure X Reactance interaction with change talk for ability ($p < .001$) and importance ($p < .05$), these change talk indicators did not predict alcohol use during the year after treatment.

Resistance Indices as Mediators of the Interaction Effect

The path coefficients from these models are presented in Figure 3. None of the resistance constructs were associated with either the Structure X Reactance interaction or alcohol use outcomes. Hence the data did not support resistance as a mediator of the effect of the Structure X Reactance interaction on post treatment alcohol use. Bivariate correlations between the resistance items ranged from $r = .38$ to $r = .84$ (average $r = .63$). Given these moderate to high relationships we also tested for mediation using a total resistance score that was calculated as the sum of all resistance items. Examination of the path coefficients from this model showed that the Structure X Reactance interaction did not predict the total resistance score, yet the total resistance score did predict post treatment alcohol use (PDA: $B = -0.02$, $SE = 0.01$, $p < .05$; PHDD: $B = .02$, $SE = .01$, $p < .01$). Although the results did not support resistance as a mediator, they suggested that increased levels of patient resistance were associated with poorer drinking outcomes.

Discussion

The present study sought to identify intervening events in the therapy process that account for the differential effects of therapist structure across patients at different levels of interpersonal reactance. Reviewing the psychotherapy literature we identified two patient-

level variables that have been found predictive of clinical outcomes: pro-change talk regarding the problem behavior and the absence of resistance to the therapeutic process. We hypothesized that these processes would be predictive of drinking outcomes, and that they in turn would be affected by the interaction of the amount of structure in evidence in the therapy and the trait reactance of the patient.

Overall, of the hypothesized mediators, only the change talk construct of taking steps was observed to partially account for the Structure X Reactance effect on post treatment drinking. The total resistance score, while related to outcome, was not related to the Structure X Reactance interaction.

Our reflections on what distinguished taking steps from the other three change talk variables led us to realize that only taking steps identified behaviors that the patient was engaging in concurrently outside of the therapy session. In contrast, importance, ability, and commitment all referred to verbal behaviors occurring within the session, not having to reference other behaviors the patient was undertaking outside of the therapy session. This distinction led us to view our findings in the specific context of the abstinent aftercare patient, whose task is to maintain sobriety and avoid a return to drinking. From this perspective, a matching of therapist structure to client reactance would be sufficient to foster change talk, and a mismatching sufficient to decrease change talk, but “talking the talk” without “walking the walk” would not suffice during this aftercare phase of treatment. Rather, while the patient is still in therapy, it is necessary that he/she be engaging in behaviors outside of therapy that are consolidating the abstinence that has been achieved.

Depending on the level of reactance of the patient, the amount of structure the therapist provides may well influence the likelihood that patients will “walk the walk.” For patients low in reactance more structure by the therapist may offer welcomed guidance and increase their likelihood of concurrently taking steps to consolidate their sobriety. For patients high in reactance, more structure by the therapist may be perceived as a challenge to their autonomy and decrease their likelihood of following through on therapist input to engage in outside-of-therapy maintenance of sobriety behaviors.

In our prior research we have focused on how attributes the patient brings to treatment interact with in-session therapist behaviors to moderate patients’ post treatment drinking outcomes. For patients in aftercare following intensive treatment in an inpatient or partial hospital setting, we have observed and replicated the hypothesis that an interaction between the amount of therapist structuring of therapy and patient trait reactance affects patient drinking outcomes. The outcomes of high reactant patients appear to be inversely related to the amount of structure the therapist initiates in therapy (Karno & Longabaugh, 2005b; Karno, Longabaugh & Herbeck, 2009). The current findings suggest that the act of taking pro-recovery steps is one explanatory factor that underlies the interaction effect.

The primary treatment model utilized to date is implicitly based on a unidirectional linear paradigm where therapist behaviors are conceptualized as affecting in-session client behaviors that in turn affect post treatment drinking outcomes (e.g., Miller & Rose, 2009). While this model is conceptually useful and parsimonious, it ignores an obvious potential source of variance in the therapy process – how what the patient brings to the therapy may affect the therapeutic process itself, and how what emerges from this therapeutic process may in turn affect patient outcomes. While our study is the only one to directly demonstrate this, circumstantial evidence for this putative process is accumulating. Apodaca and Longabaugh’s (2007) meta-analytic review of motivational interventions (MI) found in-session patient behaviors to be more strongly related to outcomes than therapist in-session behaviors. Recent studies categorizing interaction sequences in MI have found that not only

do therapist behaviors affect the probability of what the client does next, client behaviors also affect the probability of what counselors do next (Gaume, Gmel, Faouzi et al., 2008; Moyers et al., 2009). It is likely that the documented effects of client attributes and in-session behaviors on therapist behaviors during MI also occur in the context of other interventions (e.g., Moyers et al., 2007).

While the differential effects of treatment modality on drinking outcomes have been marginal, therapist effects have been much more robust (Wampold, 2001). Along with the present findings, these observations suggest it is important to examine the therapy process so as to identify the factors that account for therapist effects on clinical outcomes from treatment for alcohol use disorders.

Clinical Implications

Clinical implications of these findings are first that the reactance level of the patient should be assessed prior to the therapist deciding on how much structure to provide during the therapy. Second, the therapist needs to recognize that at least in the aftercare setting, evidence that the patient is engaged in the therapy process and conveys a pro-maintenance-of-sobriety stance is not sufficient. The therapist must create the set of conditions that lead to the patient's taking steps to maintain sobriety while he or she is still in aftercare.

Research Implications

Our findings overlap but are not totally concordant with those of others examining the relationship of the therapeutic process to drinking outcomes. Examinations of the relationship of patient behaviors during treatment to outcome have found different categories of change talk to be associated with drinking outcomes. Amrhein et al. (2003) studied a sample of treatment seeking inpatient and outpatient participants and found strength of commitment to be predictive. Gaume, Gmel, Faouzi, & Daeppen (2008) studied Emergency Department patients who received a brief motivational intervention and found ability to be the only significant predictor of drinking outcome. In our study involving aftercare patients these specific variables were not significant predictors of outcome, yet taking steps was a significant predictor. Systematic research is needed to identify the set of conditions and for whom specific kinds of change talk will be the most robust predictors of outcome. Such conditions may include the treatment modality, the treatment setting, and where patients are in the change process. The current findings suggest that for individuals who are working to maintain positive behavior change that they initiated previously, change talk reflective of taking action is especially important.

Despite the singularity of taking steps as the predictor of drinking outcomes, other change talk variables reflecting ability and importance appeared to be affected by the Reactance X Structure interaction. This indicates that the effect of different amounts of structure on high and low reactant patients had its hypothesized effect: for low reactant patients more structure increased their in-session change talk. For high reactant patients, more structure tended to lower their change talk. That these two kinds of talk, importance and ability, conceptually considered preparatory talk rather than commitment and action, suggests a parallelism with the findings of Amrhein et al (2003). These investigators found that preparatory talk predicted commitment but not outcome. Only the strength of the commitment predicted outcome. In the present study "taking steps" was the sole predictor of outcome and could be considered the highest level of commitment- pro-recovery actions.

On a methodological level, the present study suggests that measuring strength of change talk more globally based on 20-minute segments may yield results comparable to those obtained from coding at the utterance level. The main limitation of global ratings is that they do not

permit sequential analysis of therapist and patient language. Yet if research resources are limited then coding at the segment level appears to be a viable alternative to utterance-level coding.

Limitations

This study has limitations. First is one of generalizability. Our findings are limited to aftercare patients who are already abstinent, who may or may not subsequently relapse.. There is also a challenge to internal validity in that 21 patients were lost to the analysis because they only attended the first session of therapy. Our temporal measurement design required that the potential mediators be measured after the first session. Therefore we cannot determine if taking steps would also have mediated the Structure X Reactance effect for those patients who only attended the first session.

Other limitations have to do with measurement issues. The present study relied on measuring structure in just the first therapy session so as to preserve the temporal ordering necessary to establish a mechanism of change. When measured in the first session only, the Structure X Reactance interaction was not significantly related to post treatment drinking outcomes at the $p < .05$ level. While structure in the first session was a good proxy for overall therapist structure, it appears not to be as robust a predictor as therapist structure measured over multiple therapy sessions. Our previous research used an aggregate structure rating and supported a significant Structure X Reactance effect (Karno, Longabaugh & Herbeck, 2009; Karno & Longabaugh, 2005b) on post treatment alcohol use. Also, we did not achieve high levels of interrater reliability on the ratings for patient reactance. The level of reliability may have reduced the size of observed relationships and masked other relationships.

Our measurement of change talk relied on an instrument created specifically for this study. These ratings were based on 20-minute segments of client speech and hence they represent global ratings that may lack the specificity of more micro-level ratings.

Despite these limitations this study compares reasonably well when set against the criteria for a mechanism of change (Kazdin & Nock, 2003). We have evidence of association among the independent variable, mediator, and dependent variable, as well as specificity of the mediator relationship and evidence of gradient. Importantly, our study was designed to maintain temporality of variable relationships such that the independent variable preceded the mediator variable, and the mediator variable preceded the dependent variable. In terms of how our findings relate to the existing knowledge base they are plausible and coherent. As this is a first step in examining these mediators of the Structure X Reactance effect, what is of course lacking is replication of the observed mediation effect. Finally, experimental manipulation of the independent variable and ideally the mediator variable will be important to demonstrate causation.

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Figure 1.

Multiple mediator model with change talk items as hypothesized mediators of the reactance-by-structure interaction effect on post treatment PDA and PHDD. All participants were abstinent during the first week of treatment. Therapist structure and trait reactance were measured in the first treatment session. The mediators were measured after the first session but before any participant had a drinking day. Covariates included the main effects of treatment assignment, reactance, structure, and first-session ratings of change talk for ability, commitment, importance, and taking steps (paths not shown).

* $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 2. Simple slopes plot showing differential effect of therapist structure on taking steps for the low and high reactance groups. For the purpose of illustration data points selected to denote low structure and high structure were the mean $\pm 1 SD$, respectively.

Figure 3.

Multiple mediator model with resistance items as hypothesized mediators of the reactance-by-structure interaction effect on post treatment PDA and PHDD. All participants were abstinent during the first week of treatment. Therapist structure and trait reactance were measured in the first treatment session. The mediators were measured after the first session but before any participant had a drinking day. Covariates included the main effects of treatment assignment, reactance, structure, and first-session ratings on each of the resistance items (paths not shown).

* $p < .05$, ** $p < .01$, *** $p < .001$.