Patient Reactance Moderates the Effect of Directive Telephone Counseling for Methamphetamine Users

MITCHELL KARNO, PH.D.,^{a,*} DAVID FARABEE, PH.D.,^a MARY-LYNN BRECHT, PH.D.,^a AND RICHARD RAWSON, PH.D.^a

^a*Integrated Substance Abuse Programs, Department of Psychiatry & Biobehavioral Sciences, University of California, Los Angeles, Los Angeles, California*

ABSTRACT. Objective: This study examined the impact of the interaction between patient reactance and treatment directiveness on the effectiveness of telephone aftercare for methamphetamine dependence. **Method:** Reactance was assessed at baseline, and participants were randomly assigned to directive or nondirective treatment conditions. Logistic regression tested for the significance of the interaction as a predictor of 3-month and 12-month use of methamphetamine and stimulants. **Results:** A significant interaction was observed at the 3-month follow-up, in which the directive condition was less effective for patients higher in reactance and was more effective for patients lower in reactance. Among

patients at a high level of reactance, the nondirective condition increased the likelihood of abstinence. **Conclusions:** This study suggests that, in the context of telephone-based care, directive interventions offer short-term clinical benefit for methamphetamine users who readily accept influence from authority figures, whereas nondirective interventions offer benefit for patients who do not readily accept influence. The short-term nature of these effects indicates that there is a need for brief but ongoing telephone support to maintain treatment gains. (*J. Stud. Alcohol Drugs*, 73, 844–850, 2012)

IN PSYCHOTHERAPY RESEARCH, the construct of counselor directiveness has been characterized as leading the patient (Ashby et al., 1957), controlling the agenda during psychotherapy sessions (Rogers, 1942), being authoritarian (Rudolph, 1989), and teaching and confronting (Patterson and Forgatch, 1985). More recently, Karno and Longabaugh (2005a) provided empirical support that controlling the agenda and authoritarian interventions to challenge thoughts or behaviors are each unique dimensions of directiveness. Directiveness thus can be broadly understood as a class of interventions that convey therapist control. Within this class, the specific interventions (e.g., challenging behaviors and agenda setting) may or may not co-occur in a given treatment context.

Of relevance to directiveness in psychotherapy is the extent to which an individual readily accepts or rejects having his or her thoughts or behaviors influenced by others. This phenomenon has been termed *psychological reactance* (Brehm, 1966, 2000; Brehm and Brehm, 1981). A central tenet of the theory of reactance is that perceived threats to personal freedom can trigger a motivational state in which an individual directs energy toward opposing the source of the perceived threat. Concern about reactance among patients in psychotherapy has informed behavioral interventions such as

motivational interviewing for substance use disorders, which seeks to minimize the likelihood of reactance by emphasizing personal freedom and proscribing the use of directive interventions such as confrontation (e.g., Miller, 2000; Miller and Rollnick, 1991).

Yet, directive interventions in psychotherapy do not appear to be universally contraindicated. Rather, research has increasingly supported the idea that directive therapist interventions that challenge patients' current thoughts or behaviors or advise them to engage in specific thoughts or behaviors have varying degrees of effectiveness depending on the extent to which patients are receptive to influence from others. In a study comparing psychosocial treatments for depression, Beutler et al. (1991) observed that a nondirective treatment modality that was supportive and self-directed was superior for patients high in reactance compared with either cognitive-behavioral or focused-expressive therapies, which were deemed to have more counselor control and hence to be more directive. That study also found that patients low in reactance had the poorest outcome in the nondirective treatment, suggesting that a strategy of being less directive for reactant patients and more directive for patients low in reactance could yield optimal outcomes overall.

In research on behavioral treatment for alcoholism, Karno et al. (2002) found that among high reactance patients, more therapist directiveness was associated with increased post-treatment alcohol use. Conversely, low reactance patients had a better drinking outcome following more directive interventions. In this study, directiveness was operationalized as a combination of challenging thoughts and behaviors as well as controlling the session agenda. These findings converged with the earlier research on depression treatment (Beutler

Received: December 20, 2011. Revision: April 6, 2012.

This study was supported by National Institute on Drug Abuse Grant DA 018208 (to David Farabee, principal investigator).

*Correspondence may be sent to Mitchell Karno at the Integrated Substance Abuse Programs, Department of Psychiatry & Biobehavioral Sciences, University of California, Los Angeles, 11075 Santa Monica Boulevard, Suite 200, Los Angeles, CA 90025, or via email at: karno@ucla.edu.

et al., 1991) and suggested that tailoring the general level of directiveness to the level of patient reactance could play an important role in affecting outcomes of treatment for substance use disorders.

Subsequent research attempted to replicate these findings on another alcohol-treatment-seeking sample and found that therapist directiveness negatively affected outcomes for patients at medium and high levels of reactance but did not affect drinking patterns among patients low in reactance (Karno and Longabaugh, 2005a, 2005b). The most consistent finding across all of these studies was that directive counseling had a deleterious effect on treatment outcomes for patients who tended to resist being influenced by others. In two out of three of these studies, directive counseling had a beneficial effect for patients who scored low on their level of reactance.

The present study examined if patient reactance moderates the effectiveness of directive treatment for a substance other than alcohol, namely methamphetamine. This question was addressed in the context of an aftercare intervention delivered by telephone. Aftercare interventions have received mixed support (McKay, 2009; McKay et al., 2011). The present research came from a parent study that was a randomized clinical trial to examine the effectiveness of telephone-based aftercare for stimulant users. The primary aim of the parent study was to test for main-effect differences between a no-call control group and active intervention groups that varied on two dimensions of counselor influence: counselor-initiated planning and advice on pro-recovery activities (termed *directiveness*) and the level of structure the counselor imposed on the session agenda (termed *structure*). The main outcomes from the parent study revealed that the active interventions were all modestly superior to the no-call control group in reducing drug use severity (Farabee et al., in press), yet the study found no significant main-effect differences between the active intervention conditions.

A second aim of the parent study was to examine patient reactance as a moderator of response to the interventions. The current study presents this planned analysis that focuses on the relationship between patient reactance and the level of counselor-initiated planning and advice on pro-recovery activities. Consistent with prior research, the current study hypothesized that the directive condition would be more effective for patients with lower levels of reactance and that the nondirective condition (i.e., counselors do not help plan or give advice on recovery activities) would be more effective for patients at higher levels of reactance.

Method

Overview

The current study is based on a randomized clinical trial in which participants were randomly assigned to an

active telephone aftercare condition that varied on the level of counselor activity to plan and provide advice on pro-recovery activities (directive vs. nondirective) and the extent to which the counselor provided an agenda for the call (structured vs. unstructured) (2×2 factorial design). The trial also included a no-call control condition. The standard aftercare plan for all participants consisted of weekly outpatient groups offered through their outpatient treatment program and self-help meetings. The recovery support calls were provided to study participants by trained University of California, Los Angeles, research counselors. Each counselor delivered all study conditions to minimize potential counselor effects. Interviews assessing background characteristics and drug use were conducted 1 week before completion of primary treatment (baseline) and again at 3 and 12 months following study enrollment. Participants were randomized to a telephone aftercare condition after this baseline assessment and before they graduated from their intensive outpatient program. Follow-up rates for the 3- and 12-month assessments were 95.3% and 85.9%, respectively. The study had institutional review board approval from the University of California, Los Angeles.

The current study focuses on the effects of the directive and nondirective counselor advice conditions among 66 participants who were randomized into the directive condition and 71 participants who were randomized into the nondirective condition. In the parent study, the structured and unstructured agenda conditions were crossed with the directive and nondirective conditions. For the current study, the structured and unstructured cells were collapsed together within each of the directive and nondirective conditions. The no-call control condition is not included in the current study.

Study participants

The sample for the present study comprised 137 substance users who reported primary use of either methamphetamine or both methamphetamine and cocaine/crack and completed a primary phase of intensive outpatient treatment. An additional 32 participants were excluded from the current study because baseline urine toxicology was unavailable ($n = 10$), they were lost to follow-up ($n = 9$), or urine toxicology at follow-up was unavailable ($n = 13$). Thus, the current sample represents 81% of study participants ($n = 137$ of 169) who were methamphetamine users and were randomized to an intervention condition in the parent study. Participants who were excluded had a larger proportion of women (41%) than did those who were included in the current sample (23% women), $\chi^2(1, N = 169) = 4.36, p < .05$. Otherwise, no group differences were observed in age, referral source (court mandated or not), prevalence of stimulant use at baseline, Addiction Severity Index drug score (McLellan et al., 1985), or reactance score.

Participants reported an average of 9.8 years ($SD = 7.3$ years) of methamphetamine use. Years of methamphetamine use ranged from less than 1 year to 37 years. Among participants who also had primary use of cocaine, they reported 7.5 years ($SD = 7.0$ years) of cocaine use. Years of cocaine use ranged from less than 1 year to 30 years. The demographic profile of the current sample ($n = 137$) was 77.4% male with a mean age of 35.6 years ($SD = 9.3$). Sixty-six percent of participants categorized themselves as White, 23% as non-White Hispanic, and 5% as African American. Levels of education were less than high school completion (21.2%), high school completion (49.6%), some post-high school education (16.8%), and college completion or greater (12.4%). Participants reported that over the past 3 years they had maintained full-time employment (54.7%), part-time employment (19.7%), or were unemployed (17.5%). A few participants were students (1.5%), were retired (4.4%), or had been in a controlled environment (e.g., incarceration) (2.2%) over the past 3 years.

Participants all received intensive outpatient treatment at one of five outpatient treatment sites located at either the Matrix Institute on Addictions (three sites, $n = 112$) or the Twin Town Treatment Centers (two sites, $n = 25$) located in Los Angeles, San Bernardino, and Orange Counties in California. The Matrix Institute on Addictions provides cognitive-behavioral group treatment, promotes patient involvement in a 12-step program, and provides a 4-month intensive outpatient program. The first month of the program entails 2.5 hours per day of group therapy and family education for 3 days per week plus 12-step participation. Months 2–4 entail 1.5 hours per day for 3 days per week and continued 12-step participation. Participants from the Matrix Institute sites reported an average of 17.7 weeks ($SD = 5.7$) of outpatient treatment before the baseline assessment for the study.

The Twin Town Treatment Centers emphasize 12-step participation and provide treatment on relapse prevention, family counseling, stress management, and problem solving skills. Twin Town has three phases of treatment over a period of 3 months. Phase 1 is intensive outpatient treatment (3 hours daily, 5–6 days per week) for 1 month and 12-step attendance twice per week. Patients then step down to Phase 2 (1.5 hours daily) for 1 month plus regular 12-step attendance. Phase 3 is the lowest intensity phase for an additional month. Participants were recruited during Phase 2 because patients often ceased coming to formal treatment during Phase 3. Participants from the Twin Town sites reported an average of 5.2 weeks ($SD = 2.5$) of outpatient treatment before the baseline assessment for the study.

A comparison of years of stimulant use across participants in the Matrix Institute and the Twin Town programs indicated that participants in Twin Town on average had more years of prior use (mean years [SD] = 12.4 [5.5]) rela-

tive to participants in the Matrix Institute (mean years [SD] = 9.5 [7.5]); however, this difference was not statistically significant, $F(1, 135) = 3.32, p = .07$.

Counseling conditions

Participants in the telephone-based counseling conditions were contacted on a fixed temporal schedule by a trained counselor. All of the telephone counseling conditions consisted of seven telephone calls conducted according to the same schedule: 1, 2, 4, 6, 8, 10, and 12 weeks following graduation from intensive outpatient treatment. The counseling conditions were as follows:

Nondirective. Consistent with telephone counseling protocols implemented with alcohol treatment patients (Fitzgerald and Mulford, 1985), counselors in the nondirective condition provided subjects with general encouragement to participate in the outpatient continued-care program. The counselor's role was to heighten the participant's awareness of the behaviors that are associated with sustained abstinence but leave it up to the participant to incorporate these activities in his or her own life. The counselors refrained from providing specific advice and instead focused on expressing genuine concern for the participant's welfare.

Nondirective calls began with a check-in regarding how the participant was doing. The counselor then asked about what activities, if any, had been helpful in the past week for the participant's recovery. In the structured version of the nondirective intervention, the counselor used a set list of pro-recovery activities to guide this discussion (e.g., How often in the past week did you attend 12-step meetings? How often in the past week did you avoid places where drugs were available?). In the unstructured version of the intervention, participants were asked to generate their own list of helpful activities. The counselor then thanked the participant for his or her time, scheduled the next call, and encouraged the participant to attend the continuing-care group therapy sessions offered by the outpatient treatment program he or she had attended. If participants asked the counselor for advice, counselors would offer such replies as, "If this is something that you think is useful to you, I encourage you to do it" or "I would encourage you to talk about this with your continuing-care group leader."

Directive. As with the nondirective condition, counselors in the directive condition began with a general check-in about how the participant was doing and then reviewed the participant's recovery activities during the past week. In addition to encouraging participation in the outpatient continued-care program, counselors in the directive condition led a discussion about an action plan to promote engagement in recovery activities for the upcoming week. This action plan was the distinguishing characteristic of the directive intervention. For each activity that the participant

identified as helpful for his or her recovery, the counselors worked toward creating a concrete plan. Examples of counselor questions included, "What kinds of things can you plan to do in the next week to support your recovery?" and "What are some things you can do to build time into your schedule to do this activity in the next week?" The counselors provided input about how to make the action plan more specific, and they encouraged participants to expand the amount of planned activities for the next week.

Intervention fidelity

On average, subjects participated in 5.6 ($SD = 1.44$) of the 7 possible calls. The mean duration of the calls was 4 minutes, 56 seconds ($SD = 4.10$). This amount of contact is consistent with that found in the Betty Ford Center's Telephone Enhancement of Long-term Engagement (TELE) demonstration study (Hubbard et al., 2007).

Experience of the counselors ranged from a bachelor's degree with a certification in counseling to a master's degree in social work. All counselors underwent didactic training and had to demonstrate proficiency by role playing each study condition before beginning work on the study. Counselors then received weekly supervision that involved listening to taped sessions and discussing any clinical issues that arose. All of the calls during the study were tape recorded and reviewed by the project director for fidelity. Fidelity was determined based on adherence to the script for each intervention and the absence of any proscribed counselor behaviors. Common elements for both the directive and nondirective interventions included a review of recovery activities from the previous week; general encouragement to keep working on one's recovery; and counselor use of active listening, empathic responses, and a positive, encouraging attitude. The use of confrontation, arguing, or sarcasm was proscribed for both interventions. In addition to these common elements, the adherence rating for the directive condition centered on discussing a plan and giving advice to participate in recovery activities for the upcoming week. For the nondirective condition, it was proscribed for the counselor to initiate discussion about a plan for specific recovery activities in the upcoming week or to provide advice about such activities. The project director used a checklist of these prescribed and proscribed elements to evaluate the fidelity of each session.

Fewer than 5% of the sessions were rated as not adhering to the intervention scripts. Almost all of these instances involved participants in the nondirective condition actively seeking specific advice from a counselor about recovery activities and the counselor yielding to these requests and giving some form of advice. When these instances were identified, the issue was raised in the weekly project meetings, and the counselors role-played how to respond in a manner consistent with the session script.

Assessments

Patient reactance. The extent to which patients resisted influence from others was assessed via the Therapeutic Reactance Scale (Dowd et al., 1991), which was administered at baseline as a self-report questionnaire. Based on subsequent factor analysis of this scale (Buboltz et al., 2002), a subset of four items with high internal consistency (Cronbach's $\alpha = .71$ in current sample) was selected for analysis. These items target a specific component of reactance related to resistance of influence from authority figures. The content of these four items is as follows: "I resent authority figures who try to tell me what to do," "I find that I often have to question authority," "If I am told what to do I often do the opposite," and "It really bothers me when police officers tell people what to do." The average score across these four items was used for data analysis. Reactance scores were comparable between participants assigned to the directive and nondirective conditions.

Methamphetamine and cocaine use. Timeline Follow-back interviews were conducted and urine specimens were collected at baseline and at the 3- and 12-month follow-ups. The 3-month and 12-month follow-ups each covered the previous 90 days. Given that this was an aftercare sample graduating from abstinence-based treatment programs, the target outcome was use of any methamphetamine or cocaine (i.e., use vs. no use) during the follow-up period. For the present study, methamphetamine or cocaine use at follow-up was determined if either self-report or urine toxicology indicated any use. Participants who self-reported no use but did not provide a urine specimen ($n = 13$ at the 3-month follow-up) were excluded from the current analysis based on decreased confidence in the validity of the self-report data.

Data analysis

Logistic regression was used to test the hypothesis that patient reactance interacted with treatment directiveness to predict use or no use of methamphetamine or cocaine during the follow-up periods. The analysis controlled for baseline stimulant use as per urine toxicology, the number of years of amphetamine or cocaine use (whichever was greater for each participant), and whether participants were court referred for treatment. Given the difference in amount of outpatient treatment received by participants between the Twin Town program and the Matrix Institute program, the analyses also included treatment program as a covariate. The product term between patient reactance and directiveness condition was included to provide a formal statistical test of the interaction hypothesis. The dependent variable was stimulant use based on urine toxicology and self-report (as described above) over the 3-month follow-up and over the 12-month follow-up. Given the

TABLE 1. Results of logistic regression analysis ($n = 137$) predicting any use of methamphetamine or cocaine at the 3-month follow-up from the interaction of patient reactance and directive versus nondirective intervention condition

Variable	<i>B</i>	OR	95% Confidence interval	
			Lower	Upper
Baseline cocaine or methamphetamine use	-3.94**	0.02	<0.01	0.22
Years of drug use	-0.03	0.97	0.90	1.04
Drug court referral	0.25	1.28	0.35	4.65
Treatment program	-1.17	0.31	0.07	1.35
Directive condition	4.08†	58.89	0.86	4,023.32
Patient reactance	1.69**	5.39	1.64	17.71
Directive $\times$ Reactance ^a	-1.71*	0.18	0.04	0.77

Notes: Baseline cocaine or methamphetamine use (0 = yes, 1 = no); drug court referral (0 = yes, 1 = no); treatment program (0 = Twin Town, 1 = Matrix Institute); directive (0 = yes, 1 = no). Years of drug use and reactance are continuous variables. ^aThe interaction effect was tested using a one-tailed test because of the specific a priori hypothesis for the effect. The exact p value for the one-tailed test was $p = .026$.

† $p < .10$; * $p < .05$; ** $p < .01$.

directional hypotheses for the interaction and the pattern of prior empirical support, a one-tailed test was conducted for the interaction term (i.e., the direction of significant differences in slopes needed to be in the hypothesized direction).

Results

Results from the logistic regression analysis predicting stimulant use at the 3-month follow-up supported a significant interaction between level of patient reactance as measured at baseline and assignment to either the directive or nondirective telephone aftercare condition (OR = 0.18, 95% CI [0.04, 0.77], $p < .05$). Detailed results from the analysis are presented in Table 1.

The significant interaction effect indicated that the association between patient reactance and stimulant use at the 3-month follow-up differed across the directive and nondirective conditions. Among participants in the directive condition, increased levels of patient reactance were associated with greater odds of using methamphetamine or cocaine at the 3-month follow-up (OR = 5.39, 95% CI [1.64, 17.71], $p < .01$). However, no association between patient reactance and stimulant use was observed for participants in the nondirective condition ($p > .50$).

A simple slopes plot of the interaction is provided in Figure 1. Of interest, participants in the directive condition who rated lowest on reactance had the lowest likelihood of using cocaine or methamphetamine. Although overall the nondirective condition was marginally associated with a higher prevalence of use at the 3-month follow-up compared

FIGURE 1. Simple slopes plot of the Directiveness $\times$ Patient Reactance interaction as a predictor of the conditional probability of any methamphetamine or cocaine use at the 3-month follow-up. High and low reactance levels are plotted at the mean ± 1 SD, respectively.

with the directive condition (i.e., irrespective of the level of reactance) ($p < .10$), participants higher in reactance who received the directive intervention appeared to fare worse than those higher in reactance who were in the nondirective condition.

These visual impressions were formally examined using the Johnson-Neyman technique (Johnson and Fey, 1950; Johnson and Neyman, 1936; Karpman, 1983) to identify reactance scores at which significant differences in outcome were observed across treatment conditions. The MODPROBE macro for SPSS (SPSS Inc., Chicago, IL) (Hayes and Matthes, 2009) was used for this purpose. One-tailed directional tests suggested that for participants with a reactance score of 1 (the lowest score on the 4-point scale), the directive intervention was more effective than the nondirective intervention in reducing the likelihood of any stimulant use over the 3-month follow-up period ($b = -2.36, p < .05$). Among participants with a reactance score of 4 (the highest score on the 4-point scale), the results favored the nondirective intervention over the directive intervention ($b = 2.77, p < .05$).

As can be seen in Figure 1, the probability of use during the 3-month follow-up period was low for the entire sample. Given that only 17% of participants in the sample reported use of methamphetamine or cocaine at the 3-month follow-up, such a finding is to be expected. Still, the results indicated that participants in the directive condition who were low in reactance had an especially low prevalence of methamphetamine or cocaine use relative to the rest of the sample.

Results from the logistic regression analysis predicting stimulant use for the 12-month follow-up did not support an interaction between patient reactance and assignment to the directive or nondirective conditions (one tailed, $p > .20$). Among participants assigned to the directive condition, increased levels of reactance were associated with an increase in the likelihood of any stimulant use (OR = 4.69, 95% CI [1.46, 15.05], $p < .01$). This relationship was consistent with one part of the study's a priori hypothesis. Yet a similar relationship was also observed for participants assigned to the nondirective condition. Hence, rather than supporting an interaction effect, the results supported a main effect of reactance as a negative prognostic indicator over the longer term.

Discussion

The current study contributes to a growing body of empirical evidence that suggests there is a meaningful interplay between the level of interpersonal reactance by patients and the directiveness of psychosocial interventions for substance abuse and dependence. The findings indicate that this interplay is not reserved for face-to-face psychotherapy but rather also occurs in the context of brief telephone-based counseling for methamphetamine use. The results suggest that a brief assessment of reactance when a patient is being

transitioned to aftercare can help inform the extent to which a counselor takes a proactive role in developing action plans for recovery. This finding was limited to proximal outcomes during the 3-month follow-up period. Thus, the active period of the effect appears to occur closer in time to when patients receive the telephone contact. In clinical practice, sustained effects may therefore require ongoing booster contacts.

Of interest is that the pattern of results for this sample of methamphetamine users who received telephone aftercare was consistent with findings from previous research on face-to-face aftercare counseling for alcohol use disorders (Karno and Longabaugh, 2005b). Both studies demonstrated a significant interaction between directiveness and patient reactance in which there was a deleterious effect of directiveness for patients high in reactance. The current study also found a beneficial effect of directiveness for patients low in reactance. The findings support the study's a priori hypothesis and converge with other findings regarding patient reactance and therapy directiveness in the treatment of alcohol disorders (Karno et al., 2002) and depression (Beutler et al., 1991).

The consistency in findings across these studies is notable despite there being methodological differences. Karno and Longabaugh (2005b) focused on individuals with an alcohol use disorder, whereas the current study focused on individuals with a methamphetamine use disorder. Second, the methods used to assess reactance and directiveness differ. Karno and Longabaugh (2005b) used observer-based ratings to assess reactance and directiveness, whereas the current study used patient self-report to assess reactance and randomly assigned participants to directive versus nondirective conditions. Finally, the mode of treatment delivery and intensity of treatment differ. The previous study (Karno and Longabaugh, 2005b) provided up to 12 hourly sessions of in-person treatment, whereas the current study provided up to seven 5-minute (on average) sessions by telephone. The convergence of findings across studies with different methods (e.g., observer ratings vs. self-report) provides good support that the hypothesized relationships between the constructs are valid.

Where the current study and the study by Karno and Longabaugh (2005b) diverge is in the duration of the observed effect. The current study only observed the interaction effect over a proximal 3-month period, whereas the other study observed an effect over a 1-year follow-up. One factor to explain this difference is the relatively small dose of treatment delivered through the telephone intervention. Of the studies from independent samples that have examined the Reactance $\times$ Directiveness interaction (Beutler et al., 1991; Karno et al., 2002; Karno and Longabaugh, 2005b), the current study has by far the lowest dose for the intervention. This explanation suggests that brief and ongoing telephone support is important to promote abstinence over the longer term.

This study improves on previous research by measuring patient reactance before the intervention begins, thereby

having the measure of reactance be independent from any resistance that might be prompted by the counselor–client interaction. Additionally, the random assignment to treatment condition increases the internal validity of the observed effects compared with previous research that relied on post hoc ratings of counselor behaviors that were directive in nature. Further, the current study relied on correspondence between self-report and urine toxicology results for the dependent variable.

Because the current study focused on aftercare, there was not a planned assessment of readiness to change. In hindsight, this omission opens up the possibility that readiness to change may be a potential confound. We cannot rule out that the worse outcomes for participants who were high in reactance and who were randomized to the directive condition were actually attributable to lower readiness to change for these individuals. Conversely, the better outcomes for participants who were high in reactance and were randomized to the nondirective condition may have been attributable to their being higher in readiness to change. Although the analysis did include court referral as a covariate, that variable is not an ideal proxy for readiness to change. Also, random assignment may not have equally distributed participants across conditions in terms of readiness to change.

Another limitation of the study is that reactance was treated as a traitlike construct. Presumably, reactance also has a state-dependent quality that the current study does not address. Thus, the current study cannot speak to fluctuations in reactance over time or the effect of prior or current substance use disorder treatment on an individual's level of reactance. The current findings are therefore limited to the reactance level for patients at a point in time when they have completed an initial phase of intensive outpatient treatment and are transitioning into a continuing care phase of treatment.

Going forward, it will be important to examine potential mediators of this interaction effect. Specific questions to address are whether directive and nondirective telephone aftercare interventions differentially promote increased use of other aftercare treatment services and pro-recovery activities for patients at different levels of reactance.

References

- Ashby, J. D., Ford, D. H., Guerkey, B. G., Jr., Guerkey, L. F., & Snyder, W. U. (1957). Effect on clients of a reflective and a leading type of psychotherapy. *Psychological Monographs: General and Applied*, 71(24), 1–32.
- Beutler, L. E., Engle, D., Mohr, D., Daldrup, R. J., Bergan, J., Meredith, K., & Merry, W. (1991). Predictors of differential response to cognitive, experiential, and self-directed psychotherapeutic procedures. *Journal of Consulting and Clinical Psychology*, 59, 333–340.
- Brehm, J. W. (1966). *A theory of psychological reactance*. Oxford, England: Academic Press.
- Brehm, J. W. (2000). Reactance. In A. E. Kazdin (Ed.), *Encyclopedia of psychology*, 7, 10–12. Washington, DC: American Psychological Association.
- Brehm, S. S., & Brehm, J. W. (1981). *Psychological reactance: A theory of freedom and control*. Oxford, England: Academic Press.
- Buboltz, W. C., Jr., Thomas, A., & Donnell, A. J. (2002). Examining the factor structure and internal consistency reliability of the Therapeutic Reactance Scale. *Journal of Counseling & Development*, 80, 120–125.
- Dowd, E. T., Milne, C. R., & Wise, S. L. (1991). The Therapeutic Reactance Scale: A measure of psychological reactance. *Journal of Counseling & Development*, 69, 541–545.
- Farabee, D., Cousins, S., Brecht, M., Pearce, V., Bellows, A., Brummer, J., et al. (in press). A comparison of four telephone-based coaching styles for recovering stimulant users. *Psychology of Addictive Behaviors*.
- Fitzgerald, J. L., & Mulford, H. A. (1985). An experimental test of telephone aftercare contacts with alcoholics. *Journal of Studies on Alcohol*, 46, 418–424.
- Hayes, A. F., & Matthes, J. (2009). Computational procedures for probing interactions in OLS and logistic regression: SPSS and SAS implementations. *Behavior Research Methods*, 41, 924–936.
- Hubbard, R. L., Leimberger, J. D., Haynes, L., Patkar, A. A., Holter, J., Liepman, M. R., . . . Hasson, A. (2007). Telephone enhancement of long-term engagement (TELE) in continuing care for substance abuse treatment: A NIDA Clinical Trials Network (CTN) study. *American Journal on Addictions*, 16, 495–502.
- Johnson, P. O., & Fay, L. C. (1950). The Johnson-Neyman technique, its theory and application. *Psychometrika*, 15, 349–367.
- Johnson, P. O., & Neyman, J. (1936). Tests of certain linear hypotheses and their application to some educational problems. *Statistical Research Memoirs*, 1, 57–93.
- Karno, M. P., Beutler, L. E., & Harwood, T. M. (2002). Interactions between psychotherapy procedures and patient attributes that predict alcohol treatment effectiveness: A preliminary report. *Addictive Behaviors*, 27, 779–797.
- Karno, M. P., & Longabaugh, R. (2005a). An examination of how therapist directiveness interacts with patient anger and reactance to predict alcohol use. *Journal of Studies on Alcohol*, 66, 825–832.
- Karno, M. P., & Longabaugh, R. (2005b). Less directiveness by therapists improves drinking outcomes of reactant clients in alcoholism treatment. *Journal of Consulting and Clinical Psychology*, 73, 262–267.
- Karpman, M. B. (1983). The Johnson-Neyman technique using SPSS or BMDP. *Educational and Psychological Measurement*, 43, 137–147.
- McKay, J. R. (2009). Continuing care research: What we have learned and where we are going. *Journal of Substance Abuse Treatment*, 36, 131–145.
- McKay, J. R., Van Horn, D., Oslin, D. W., Ivey, M., Drapkin, M. L., Coviello, D. M., . . . Lynch, K. G. (2011). Extended telephone-based continuing care for alcohol dependence: 24-month outcomes and subgroup analyses. *Addiction*, 106, 1760–1769.
- McLellan, A. T., Luborsky, L., Woody, G. E., & O'Brien, C. P. (1985). *Guide to Addiction Severity Index*. Washington, DC: U. S. Government Printing Office.
- Miller, W. R. (2000). Motivational Enhancement Therapy: Description of counseling approach. In J. J. Boren, L. S. Onken, & K. M. Carroll (Eds.), *Approaches to drug abuse counseling*. Washington, DC: National Institute on Drug Abuse.
- Miller, W. R., & Rollnick, S. (1991). *Motivational interviewing: Preparing people to change addictive behavior*. New York, NY: Guilford Press.
- Patterson, G. R., & Forgatch, M. S. (1985). Therapist behavior as a determinant for client noncompliance: A paradox for the behavior modifier. *Journal of Consulting and Clinical Psychology*, 53, 846–851.
- Rogers, C. R. (1942). *Counseling and psychotherapy: Newer concepts in practice*. Boston, MA: Houghton Mifflin.
- Rudolph, J. (1989). Effects of an affirmative gay psychotherapy workshop on counselors' authoritarianism. *Psychological Reports*, 65, 945–946.