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The Influence of Client Behavior during Motivational Interviewing on Marijuana Treatment Outcome

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Abstract

Psychotherapy process research continues to be important in identifying within session client and therapist behaviors related to outcome. Motivational Interviewing (MI) assumes that the type of client language elicited within session is important. Client behavior was coded from 61 MI sessions with marijuana dependent adults. Sessions were coded for client language using the Client Language and Commitment Scale. Client statements indicating desire and reasons for change were significantly predictive of marijuana treatment outcome through the 34-month follow-up above and beyond baseline levels of marijuana use or motivation for change. Commitment language was not associated with outcomes. These findings suggest specific types of client language statements predict marijuana treatment outcome and are durable to a 34-month follow-up.

Keywords

motivational interviewing; motivational enhancement therapy; commitment language; therapy process; marijuana; cannabis; process; outcome

Although motivational interviewing (MI) is a popular and widely studied intervention (Miller & Rollnick, 2002), very little is known regarding its mechanisms of action. A general assumption of psychotherapy is that behavior change emerges through conversation. Talk is central to MI, the purpose of which is to elicit particular types of statements from clients as a means of resolving ambivalence and increasing motivation towards change (Miller & Rollnick, 2002). Ambivalence (the state of feeling two ways about something) is manifested by two competing but equally strong desires: “I do and I don’t want to change.” Client language reflects both sides of this conflict with statements in favor of change (change talk) and those in favor of maintaining current behavior (status quo talk or resistance). MI seeks to evoke and strengthen change talk from clients such as statements that acknowledge advantages of or intentions to change, disadvantages to not changing, or hope about change. Conversely, MI intends to avoid eliciting resistance statements in clients. Implicit in this approach is the assumption that client language affects or is at least predictive of client behavior.

A handful of studies suggest client language is indeed important to understand. Statements in favor of change made by clients within session have been found to predict drinking and

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drug use outcomes. One study evaluated client language across therapy types in data from Project MATCH (Project MATCH Research Group, 1997). Findings revealed client change talk predicted drinking outcomes above and beyond baseline readiness to change (Moyers et al., 2007), providing evidence that what a client says during treatment represents something more than pre-treatment motivation to change. This is one of the only studies that has looked at the impact of motivation level on client language and outcome. Given that it was a pilot study, replication of these results is needed.

Amrhein and colleagues (2003) explored the relationship between client speech during a MI session and drug use outcomes. MI session videotapes were coded for frequency and strength of client utterances for 84 drug abusers. Language was coded into one of six categories indicating desire, ability, reasons, need, readiness or commitment to change behavior. Frequency of client utterances was not predictive of behavioral outcome. However, strength of commitment language at the end of the session (7th and 10th session deciles) was predictive of drug use outcome above and beyond level of drug use at baseline. Ratings of the strength of client statements expressing desire, ability, need or reasons to change drug use did not predict outcomes. However, each was significantly related to strength of commitment language, suggesting these may be underlying motivational dimensions of commitment. Thus, what a client says (strength of commitment language) and when they say it (near the end of the session) appeared to be related to drug use behavior following treatment. The exploratory nature of the analyses, however, undermines confidence in this conclusion. Therapy sessions were parsed into deciles in order to explore when client language might matter, with positive predictive findings for only two of the ten deciles. Although these findings were explained in relation to events likely happening in the later portion of MI sessions post-hoc, the number of analyses conducted raises concerns about inflated Type I error rates.

Strength of commitment language was found to be predictive of gambling outcomes (Hodgins, Ching, & McEwen, 2009). This study failed to replicate the finding that commitment language during the latter part of the session was a better indicator of outcome. Rather, the MI sessions were more variable and the specific timing of interview topics varied between sessions. Gaume and colleagues found patient talk that represented ability to change rather than commitment to change predicted drinking in a brief intervention (Gaume, Gmel, & Daepfen, 2008). Prospective replication of the importance of commitment language and ability language during theoretically relevant periods of the therapy sessions and with additional populations of drug users is needed.

MI has been one of the most popular interventions studied in the cannabis disorder treatment field. Motivational enhancement therapy (an adaptation of MI that includes the provision of personalized feedback) has been shown to be an efficacious treatment for cannabis disorders alone (Copeland, Swift, Roffman & Stephens, 2001; Budney, et al., 2000; Stephens, et al., 2000) or in combination with cognitive-behavior therapy (Marijuana Treatment Project Group, 2004) and/or contingency management (Budney et al., 2006; Kadden, Litt, Kabela-Cormier, & Petry, 2007). Of the eight adult cannabis treatment trials conducted, seven have included a MET condition (see Budney, Stephens, Roffman, & Walker, 2007 for a review).

The current study uses data from a randomized controlled trial of treatments for adult cannabis dependence to examine the relationships between client verbal behavior and marijuana use outcomes at follow-up. Specifically, this study was interested in examining the relationship between client language and marijuana use among marijuana dependent adults seeking treatment and to evaluate the relationship between pre-treatment level of motivation to change, client language and marijuana use outcomes. Continuing to identify how client language is related to treatment outcome is important given the emerging

evidence suggesting counselors can work to elicit particular types of statements in clients (Moyers & Martin, 2006; Moyers et al., 2007; Miller, Benefield, & Tonigan, 1993).

Method

Overview of Parent Clinical Trial

This paper reports findings from a secondary analysis of data collected as part of a randomized controlled trial of treatments for adult marijuana dependence (Stephens et al., 2006). Adults seeking treatment for marijuana use were screened for eligibility and, following informed consent, were randomized into one of two treatment conditions: 9 sessions of MI/CBT/Case Management completed over 12 weeks versus a smaller initial dose of the same treatment (4 sessions of MI/CBT/Case Management over 4 weeks) with the opportunity to return repeatedly for additional treatment episodes as needed over a 30-month period. Both conditions began treatment with identical sessions of MI, including a review of a personalized feedback report (PFR) regarding their marijuana use, delivered by the same trained therapists.

Videotape Transcription and Coding

All therapy sessions were videotaped and the present analysis makes use of the recordings from the first session in both conditions. Each videotape was transcribed, clearly demarcating utterances made by the therapist and client. The transcripts were then parsed into deciles using videocassette counters as a way to standardize sessions of varying lengths by each tenth of the session following the example of Amrhein and colleagues (2003).

The Client Language and Coding System (CLACS, Amrhein, 2002) was used to document client utterances reflecting aspects of motivation for change. Each statement was coded into one of 6 categories: desire, ability, reasons, need, commitment, and readiness to change marijuana use. The strength of each utterance was then coded on a scale ranging from -5 to +5, with positive values reflecting expressions toward a reduction in drug use and negative values reflecting expressions toward maintaining or continuing drug use. Two raters were trained to use the CLACS coding system with a training manual that describes guidelines for assigning strength ratings. Following initial training, coders attended regular supervision sessions to discuss problems and prevent drift. These two raters independently coded each session tape and were blind to client outcome measures and identity. Interrater agreement was analyzed by using intraclass correlations computed across deciles on the average strength rating within each category. Intraclass correlations for the CLACS data were .68 for Commitment, .73 for Desire, .68 for Ability, .74 for Need, .76 for Readiness, and .68 for Reasons.

In order to study specific portions of the therapy sessions that were likely to relate to outcomes, all client and therapist variables were calculated from the decile-level ratings for three distinct periods of the first treatment session. We reasoned that the presentation and discussion of the PFR represented a potentially powerful period for the elicitation of change talk on the part of the client. Therefore, all client and therapist variables were calculated idiographically based on when PFRs were introduced and discussed during the first session as follows: 1) all deciles from the start of the session through the decile before the introduction of the PFR report; 2) from the decile in which the PFR was first introduced through all deciles in which the PFR was discussed; and 3) the remaining deciles following conclusion of the discussion of the PFR. These periods correspond to introductory presentation of information about the study and rapport building, the presentation of normative feedback and MI, and final remarks and scheduling of the next session,

respectively. Five participants ended the treatment session still discussing the PFR and are not included in analyses involving post-PFR period variables.

Participants

We screened 203 marijuana using adults over a period of 33 weeks to arrive at a final randomized sample of 87. Eligible participants had to be 18 years of age or older and meet DSM-IV diagnostic criteria for cannabis dependence based on SCID interviews. Recruitment consisted of paid advertisements in a variety of print and radio media offering treatment for marijuana-related problems. Of those screened, 65 were ineligible for participation because they were dependent on alcohol or other drugs ($n = 23$), were currently involved in other treatment ($n = 27$), had used marijuana on less than 50 of the past 90 days ($n = 21$), or met one of the other exclusion criteria ($n = 11$; no evidence of psychosis/suicidality, fluent in English, available locally for the duration of the study). Another 51 screened participants were eligible but chose not to enroll in the study.

Of the original 87 participants randomized to condition in the parent trial, 5 were excluded from these analyses because they did not attend any follow-up assessment interviews, 9 were excluded because a personalized feedback report was not reviewed during the first treatment session, and 12 participants were excluded because of malfunctioning recording equipment during their first treatment sessions. The remaining 61 participants consisted of 48 males and 13 females with an average age of 35.05 years and an average of 14.02 years of education. Eighty-eight per cent of the sample was Caucasian (see Table 1 for more information on the original and included samples).

Marijuana Use and Outcome Measures

Self-reported marijuana use was assessed at baseline and at 4, 10, 16, 22, 28, and 34 months from intake with a modified version of the Form 90I. This is a structured interview based on the time line follow-back procedure (Sobell, Maisto, Sobell, & Cooper, 1979) demonstrated to have good reliability and validity (Sobell & Sobell, 1992). The time window queried was 90 days prior to the baseline interview, 120 days prior to the 4-month assessment and 180 days prior to all later follow-ups in order to provide a continuous assessment of drug use throughout the study period. Proportion of days abstinent from marijuana at each assessment point was the primary outcome measure. This self-report measure was corroborated with both collateral informant reports and ten panel urine toxicology drug screens (EMIT) plus confirmation (GC/MS) at each assessment interview.

Motivation for changing marijuana use was assessed at baseline using the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES; Miller & Tonigan, 1996). The SOCRATES is a 19-item index designed to assess stages of change specific to alcohol or drug abuse. The scale yields three scores: Recognition, Ambivalence, and Taking Steps. The scales have good psychometric properties in relation to alcohol use change (Miller & Tonigan, 1996). Cronbach's Alpha for the three subscales in this study at the baseline administration was 0.89 for Taking Steps, 0.82 for Recognition, and 0.52 for Ambivalence.

Data Analyses

Prior analyses in the full sample showed that near-daily marijuana use at baseline was substantially and significantly reduced at all follow-ups (Stephens et al., 2006). Participants in the 9-session condition reported a lower proportion of days of marijuana use at the 4-month follow-up than those in the 4-session condition, but there were no significant differences on any other outcomes at any other time points. Given the identical treatment procedures during the first session, similar outcomes, and relatively small sample size, the sample was collapsed across treatment conditions for the present analyses. Means and

standard deviations for marijuana use at each assessment are presented in Table 2. Transformations of the data were performed to improve normality of the distributions of proportion of days abstinent from marijuana, but results in all analyses were highly similar and we present those based on the raw data for ease of interpretation.

There were no significant differences between those participants excluded from the present analyses due to tape malfunctions or other missing data and those included on baseline demographic, substance use, or motivational (e.g., stage of change) variables, suggesting that the present findings are generalizable to the original randomized sample (see Table 1). Missing data were essentially nonexistent at baseline and minimal later due to high follow-up rates (85–100% across follow-ups). Missing values at follow-up were replaced using an expected maximization algorithm conditional on observed values for demographic, condition, marijuana use, abuse, dependence, and problem variables at each time point (Schafer & Graham, 2002).

In order to examine the relationships between client language and change in marijuana use outcomes, we first examined partial correlations between each client language category and marijuana use at each follow-up controlling for baseline marijuana use. We conducted these analyses for all portions of the therapy session to assess whether the PFR portion of the session yielded better prediction. Next, in order to test whether different types of client language made unique and additive contributions to the prediction of change in marijuana use, we regressed the proportion of days of marijuana use at each follow-up on all five language category variables during the PFR portion on the therapy session with baseline marijuana use entered as a control variable. Finally, in order to test whether client language variables contributed to the prediction of follow-up marijuana use beyond baseline levels of readiness for change, we repeated the regression analyses adding the three subscales of SOCRATES as control variables.

Results

Table 3 shows partial correlations between client language and the proportion of days abstinent from marijuana use at follow-up after controlling for baseline marijuana use. Reason and Desire strength during the PFR period show consistent relationships to increased abstinence at follow-up. There is some evidence of a relationship between Reason strength during the pre-PFR period and outcome, although it only reaches the level of $p < .05$ at the 34 month follow-up. There is also a single significant relationship between Ability strength during the post-PFR period and outcome at 16-months. We explored multivariate prediction of outcomes by regressing marijuana use at each follow-up on all five CLACs client language variables from the PFR period after controlling for baseline marijuana use. Consistent with the partial correlations the block of client language variables explained additional variance in outcomes with Desire and Reason strength contributing unique effects (see Table 4).

Client language was predictive of outcome in this study, leading us to question whether client language simply reflected preexisting differences in motivation for change. Therefore, we repeated the regression analyses predicting outcomes at each follow-up from client language and added the three SOCRATES scales (Problem Recognition, Ambivalence, and Taking Steps) as additional predictors. The significant relationships between client outcome and CLACS ratings of Desire and Reasons for change remained significant. The SOCRATES subscales did not contribute unique variance to the model at any follow-up.

Discussion

The current study sought to replicate and extend the process research on Motivational Interviewing by examining the relationship between client language and client outcome among marijuana dependent adults. In general, this study supports previous research suggesting that what a client says during therapy relates to addictive behaviors outcomes. Findings did not support the earlier findings of Amrhein and colleagues (2003) and that of Hodgins, Ching and McEwen (2009) suggesting commitment language is the specific type of client language that is most predictive of client outcome. Rather, client expressions of desire and reasons for change during the PFR period were robustly associated with outcomes across the follow-up period for this marijuana dependent sample.

Client expressions of statements of desire and reasons for change were clear predictors of marijuana use outcomes above and beyond pretreatment levels of marijuana use and motivation for change. It is also interesting to note that in multivariate analyses they retained unique predictive power, suggesting that expressions of reasons and desire for change are not simply redundant measures of the same overall motivation for change. These findings provide support for a main assumption in MI: that the more a client advocates for change, the more likely they will be to achieve such change. Client language in session is accounting for something that is not captured by a pre-treatment assessment of motivation for change. This finding is consistent with other studies with adults (Amrhein, et al., 2003; Gaume, Gmel, & Daepfen, 2008; Hodgins, Ching, & McEwen, 2009) and adolescents (Baer et al., 2008) that what a client says in therapy is predictive of subsequent behavior. Surprising in the current study was the durability of these relationships over a 34-month follow-up period.

The PFR period of the session was fruitful in terms of assessing meaningfully predictive client utterances. Although utterances regarding reasons for change during the pre-PFR period showed some prediction of outcome, desire for change did not emerge as a predictor until the PFR was discussed. This potentially is an important finding given that Motivational Interviewing can be conducted in the absence of personalized feedback. MI may be more effective in obtaining client utterances associated with change when personalized feedback is included in the intervention. Future studies could compare levels of client change talk in MI sessions with and without the provision of feedback. Similarly, it would be clinically important to know if certain feedback topics (e.g., normative data, consequences of use, biological markers) generate more change talk than others to get the most “bang for the buck” with regard to the content of a session.

We were unable to replicate Amrhein and colleagues (2003) findings on commitment language as the best client language predictor of substance abuse outcomes despite using the same coding system. Both the present study and the Amrhein study began drug abuse treatment with a MI session and concluded the first session with a change plan worksheet. The Amrhein study differed from the present study in that it examined MI sessions as a pre-intervention prior to outpatient or inpatient drug abuse treatment conducted by a counselor other than the one who delivered the primary therapy, whereas in the present study the session was delivered by the same counselor who conducted the CBT/Case Management treatment. We focused exclusively on marijuana dependent adults whereas Amrhein included drug dependent individuals in general. Baer et al (2008) also did not find commitment language to be a significant predictor of substance use outcomes among adolescents. Similar to the adolescent study, instances of commitment language were rare in the present study even in the presence of a change plan completed near the end of the first session. Our findings suggest client statements focusing on desire and reasons for changing are important to elicit and hear in a MI session.

Findings from the current study should be understood in the presence of a few caveats. Only the first session of counseling was coded. Participants in this study received varying levels of additional counseling focused on CBT and Case Management. Client language across the course of treatment may be valuable to examine. It is unclear how type of counseling approach may affect client language. Not surprising, change talk can be elicited using other types of counseling approaches (Glynn & Moyers, 2010; Moyers et al., 2007). Nevertheless, how client language is manifested in treatment other than MI may be interesting to pursue.

Given that many applications of MI interventions occur in brief encounters such as emergency departments and health clinics, studies examining if there is a difference in outcomes for longer versus brief encounters where naturally, the opportunity for clients to make statements in favor of change would differ would also be important to understand. Client change talk is elicited in brief encounters and has been found to predict drinking outcomes (Daepfen, Bertholet, Gmel, & Gaume, 2010). Comparing longer versus shorter interventions with the same population may provide some insight on optimal dose of MI that can elicit client change talk and still relate to future behavior.

Similarly, the impact of the interaction with the counselor warrants attention. Can client utterances be elicited through questionnaires or other means and is it as effective in promoting positive outcomes? Some research suggests that change talk can indeed be drawn out through mailed questions requesting written responses (Collins, Carey, & Smyth, 2005). New work in marijuana treatment is piloting computerized versions of MET and CBT (Budney, et al., in press). This computerized program attempts to elicit from the client change talk by asking questions at the end of the computer modules. Questions are raised as to how to elicit “change talk” via a computer interaction and if it is just as effective as an in-person and live communication with another individual. Comparing different modalities (written, computerized, versus verbal) of eliciting such client statements has not been done. The present findings emphasize the importance of further studying client utterances as predictors of change while at the same time signaling the inherent challenges.

Research highlights

Client change talk in therapy is examined among marijuana dependent individuals. . Client statements indicating desire and reasons for change were significantly predictive of marijuana treatment outcome through the 34-month follow-up. Specific types of client language statements predict marijuana treatment outcome and are durable to a 34-month follow-up.

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Table 1

Baseline Demographic and Marijuana Use.

Variable	Full Sample (n = 87)	Included Sample (n = 61)	Excluded Sample (n = 26)
Age	35.6 (8.7)	35.1 (8.1)	36.9 (10.1)
Gender (male)	74.7%	78.7%	65.4%
Race	86.2% White	88.5% White	80.8% White
Education (years)	14.2 (1.8)	14.0 (1.8)	14.5 (1.9)
Age first smoked marijuana	14.7 (3.0)	14.3 (3.0)	15.4 (3.0)
Age first smoked daily	19.8 (6.1)	19.0 (6.0)	21.5 (6.0)
Percent days abstinent (of 90)	15.7 (17.5)	14.0 (16.5)	19.6 (19.3)
SCID Abuse symptoms	1.6 (0.7)	1.6 (0.8)	1.6 (0.6)
SCID Dependence symptoms	5.7 (1.1)	5.8 (1.0)	5.6 (1.3)
SOCRATES			
Problem recognition	29.3 (4.2)	29.6 (4.1)	28.7 (4.5)
Ambivalence	16.5 (2.5)	16.6 (2.5)	16.3 (2.7)
Taking steps	27.6 (7.0)	26.8 (7.4)	29.3 (6.0)

Table 2

Proportion Days Abstinent.

	Mean	SD
Baseline	0.14	0.17
4 Months	0.60	0.34
16 Months	0.54	0.40
34 Months	0.58	0.42
Overall	0.54	0.33

n = 61

Table 3

Partial correlations between CLACS strength variables and percent days abstinent controlling or baseline use levels.

Session Period	CLACS	Proportion Days Abstinent					Overall
		M	SD	4m	16m	34m	
Pre-PFR	Ability	-0.70	0.94	.20	.14	.03	.16
	Commit	-0.11	0.57	.17	.06	.19	.14
	Desire	0.52	1.35	.08	.00	.17	.07
	Reason	0.47	0.86	.25*	.21*	.27**	.24*
	Need	1.30	0.93	.13	-.07	.04	.04
PFR	Ability	-0.46	0.84	.15	.28**	-.02	.13
	Commit	-0.23	0.47	.08	.14	-.04	.02
	Desire	0.53	1.04	.30***	.27**	.34***	.29**
	Reason	0.33	0.60	.29**	.26**	.18	.32**
	Need	1.09	0.77	.17	-.07	.12	.03
Post-PFR	Ability	-0.25	1.22	.15	.29**	.11	.21
	Commit	1.02	0.86	-.11	.03	-.02	-.01
	Desire	1.03	1.40	.02	.13	.09	.06
	Reason	0.46	1.32	-.02	-.06	-.17	-.05
	Need	1.26	0.91	-.03	-.11	-.09	-.14

n = 61 for Pre and PFR, n=56 for Post

* $p < 0.1$,

** $p < 0.05$,

*** $p < 0.01$.

Table 4

Standardized regression coefficients predicting proportion days abstinent at follow-up from PFR-period client language.

Variables	Proportion Days Abstinent			
	4m	16m	34m	Overall
Baseline use	.28 ^{***}	.32 ^{***}	.03	.22 [*]
R ²	.08 ^{***}	.10 ^{***}	.00	.05 [*]
Ability	.03	.18	-.13	.04
Commitment	-.04	-.03	-.10	-.11
Desire	.24 [*]	.23 [*]	.37 ^{***}	.28 ^{***}
Need	.01	-.25 [*]	-.01	-.17
Reason	.24 [*]	.27 ^{***}	.18	.34 ^{***}
R ²	.22 ^{***}	.28 ^{***}	.16	.23 ^{***}
Δ R ²	.14	.18 ^{**}	.16 [*]	.18 ^{***}

n = 61

* $p < 0.1$,

** $p < 0.05$,

*** $p < 0.01$.