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Short communication

Within-session communication patterns predict alcohol treatment outcomes

Jon M. Houck*, Theresa B. Moyers

Center on Alcoholism, Substance Abuse, and Addictions, Department of Psychology, 1 University of New Mexico, MSC11 6280, Albuquerque, NM 87131, United States

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ABSTRACT

Background: Within-session client speech is theorized to be a key mechanism of behavior change in motivational interviewing (MI), a directional, client-centered approach to behavior change. Client change talk (CT: speech indicating movement toward changing a problematic health behavior) and sustain talk (ST: speech supporting continuing a problematic health behavior) have each shown relationships with outcomes. However, it may be the case that *patterns* of within-session client speech, rather than counts of client speech, are important for producing change.
Methods: Recorded initial MI/MET psychotherapy sessions from Project MATCH had been previously rated using the Motivational Interviewing Sequential Code for Observing Process Exchange (MI-SCOPE), a mutually exclusive and exhaustive sequential coding system. From these existing data, session conditional probabilities for transitions of interest (the transition from CT to more CT, and the transition from reflections of CT to CT) were analyzed as empirical Bayes estimates of log-normalized odds ratios.
Results: CT frequencies and these log-normalized odds ratios were entered as independent variables into longitudinal generalized estimating equation (GEE) models predicting within-treatment and post-treatment drinking. While all variables were significant predictors of within-treatment drinking, only the CT–CT transition emerged as a significant predictor of decreased drinking after treatment.
Conclusions: The momentum of a client's speech about change during an MI session may be a better predictor of outcome than is a simple frequency count of it. Attending not only to the mere occurrence of CT, but also recognizing the importance of consecutive client statements of CT, may improve treatment outcomes.

1. Introduction

Interest in the effects of within-session client speech in motivational interviewing (MI) dates back over twenty years, when Miller et al. (1993) found that a confrontational clinician style was related to significantly more occurrences of resistant client speech, in turn predicting more drinking one year after treatment. Subsequent studies validated this effect in multiple populations and substances of abuse, using both measures of the strength (Amrhein et al., 2003) and frequency of client change language (Apodaca et al., 2014; D'Amico et al., 2015; Moyers et al., 2007; Vader et al., 2010). The MI literature now provides some evidence for a causal chain in MI, in which client change language mediates the relationship between therapist behavior and treatment outcomes (Magill et al., 2014). Such client speech is influenced by the MI clinician (Moyers and Martin, 2006), and clinician training studies have demonstrated that specialized training in MI produces changes not only in therapist speech, but also in the speech of their clients (Miller et al., 2004). This research base suggests that clinicians can be trained to influence the in-session speech of their clients, with subsequent effects on treatment outcomes.

The importance of within-session client speech is not limited to MI. One study of audio recordings from Project MATCH found that client change talk (CT: speech indicating movement toward changing a problematic health behavior) was a significant predictor of drinking outcomes not only in MI, but also in twelve-step facilitation (TSF) and cognitive behavior therapy (CBT) (Moyers et al., 2007). Subsequent studies have found that client speech indicating resistance and change were each associated with specific clinician behaviors and predicted outcomes in CBT for cocaine use (Aharonovich et al., 2008) and for anxiety (Lombardi et al., 2014),

* Corresponding author. Tel.: +1 5057309760.
E-mail addresses: jhouck@unm.edu (J.M. Houck), tmoyers@unm.edu (T.B. Moyers).

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suggesting that the strategic elicitation and reinforcement of CT, a theorized mechanism of behavior change in MI (Moyers et al., 2009), could be adopted by other treatment approaches.

The study of relationships between clinician and client speech links to a long tradition in psychotherapy of examining temporal patterns during sessions (Hill et al., 1983). This sequential coding process preserves the temporal sequence of behaviors (speech) during treatment sessions, allowing the researcher to ask "What happened next?" Several research groups have now employed this approach in detailed examinations of MI sessions (Barnett et al., 2014; D'Amico et al., 2015; Houck et al., in press), revealing consistent communication patterns such as the transition from clinician reflections of CT (RefCT) to additional offering of CT by the client (*e.g.*, [You're ready to do this now.][I feel like it's finally time.]) and from client CT to additional client CT (*e.g.*, [I want to change.][I really need to stop drinking now]).

The goal of the present study was to evaluate the relationship between within-session communication patterns and alcohol treatment outcomes using a large sample ($n = 118$) of audio-recorded psychotherapy sessions. All sessions had previously been rated using a mutually exclusive and exhaustive sequential coding system, the Motivational Interviewing Sequential Code for Observing Process Exchanges (MI-SCOPE: Martin et al., 2005). The count of client CT in these sessions has previously been linked to treatment outcomes (Moyers et al., 2009), but the relationship of communication patterns to outcomes has not yet been examined in any MI study. It is possible that these exchanges, more than the simple counts of speech events, will provide a more sophisticated metric for evaluating in-session behavior as it relates to clinical outcomes. Notably, the MI-SCOPE contains two categories of clinician behavior that had never previously been quantified in psychotherapy research: reflections of CT (RefCT) and reflections of sustain talk (RefST). These behaviors are related directly to MI's strategic focus on CT and have since been incorporated into the Motivational Interviewing Skills Code (Houck et al., 2010). Therefore, we hypothesized that both the conditional probability of CT given that a clinician reflection of CT had just occurred (*i.e.*, $P(\text{CT}|\text{RefCT})$) and the conditional probability of client CT given that CT had just occurred (*i.e.*, $P(\text{CT}|\text{CT})$) would each predict alcohol treatment outcomes, beyond the effects of CT frequency alone.

2. Method

Data were obtained from the PREMIR study (Moyers et al., 2009), which evaluated a hypothesized causal chain for MI using a sample of recorded psychotherapy interventions and outcome data from the Motivational Enhancement Therapy (MET) condition of Project MATCH. This sample included the initial sessions of 118 clients and involved 13 clinicians. Detailed information on therapist training and supervision in Project MATCH can be found elsewhere (Project MATCH Research Group, 1998). The MI-SCOPE sequential coding system was used to generate counts and transition probabilities. Study procedures were approved by the research institution's Institutional Review Board.

2.1. Participants

One hundred and eighteen sessions were evaluated by the PREMIR study and provided content for this analysis. Participants in this sample had a mean age of 41.1 years (SD 10.8), were primarily male (77.1%) and white (76.3%), and reported substantial daily alcohol use prior to treatment (baseline ml EtOH $M = 258.40$, SD = 176.04).

2.2. PREMIR study coding procedures

After transcription, sessions were evaluated using both the recorded audio and the transcript. In an initial pass, a rater parsed each session into sequential utterances (*i.e.*, thought units) and indicated inaudible utterances. In a second pass, a different rater evaluated each session using the MI-SCOPE, categorizing each sequential utterance into one and only one category. Inter-rater reliabilities for the variables of interest have been reported previously and were in the good-to-excellent range (Moyers et al., 2009).

2.3. Outcome measures

The outcome measure of interest for the present study was the number of drinks per week (DW). This measure was selected to ensure consistency with our prior work (Moyers et al., 2009). Two periods of interest were examined: within-treatment (weeks 1–5 after enrollment in Project MATCH) and proximal (months 4–9 after enrollment). DW was computed as in the prior study using this dataset as $\text{DDD} \times 7 \times (1 - \text{PDA})$.

2.4. Statistical analysis

Raw lag-1 transition frequencies were computed from sequential coding data using the General Sequential Querier (GSEQ: Bakeman and Quera, 2012) and converted to log-normalized odds ratios (*LNOR*). Raw *LNOR* vary in precision between sessions according to the count of the target sequences within each session. Usage of *LNOR* that does not address this variability will be flawed (Dagne et al., 2002). Therefore, Empirical Bayes estimates of *LNOR* were computed from these data in MPlus 7.31 (Muthén and Muthén, 1998–2015) using procedures described by Dagne et al. (2002), as implemented by Muthén and Asparouhov (2002). *LNOR* are the natural log transformation of the odds ratio comparing the odds of the transition of interest occurring relative to the odds of all other transitions occurring. See Fig. 1 for an illustrative example.

For sequential analysis, the transitions of interest were (CT|RefCT), (CT|CT), (ST|RefST) and (ST|ST). Longitudinal generalized estimating equation (GEE) regression measures were used to examine the effects of transitions and counts on drinking outcomes, using overdispersed Poisson models to address the non-normal distribution of drinking outcomes. Separate GEE overdispersed Poisson models were fit for within-treatment (centered at Week 5) and proximal DW (centered at month 9) using HLM 7.

3. Results

3.1. Sequential analysis

Complete conditional probabilities for this sample have been reported previously (Moyers et al., 2009). Briefly, CT was significantly more likely than expected by chance to follow reflections of CT ($P(\text{CT}|\text{RefCT}) = 0.44$), and was also significantly more likely than expected by chance to follow CT ($P(\text{CT}|\text{CT}) = 0.24$). Sustain talk was significantly more likely than expected by chance to follow reflections of sustain talk ($P(\text{ST}|\text{RefST}) = 0.38$), and was also significantly more likely than expected by chance to follow sustain talk ($P(\text{ST}|\text{ST}) = 0.14$). Per session, on average the CT|CT transition occurred 12.9 times (SD = 8.37), CT|RefCT occurred 1.99 times (SD = 0.86), ST|ST occurred 1.01 time (SD = 1.46) and ST|RefST occurred 2.50 times (SD = 1.15).