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## Examining the Influence of Active Ingredients of Motivational Interviewing on Client Change Talk

Margo C. Villarosa-Hurlocker, Ph.D.<sup>a,b,\*</sup>, Anthony J. O'Sickey, M.S.<sup>a,b</sup>, Jon M. Houck, Ph.D.<sup>a,b</sup>, and Theresa B. Moyers, Ph.D.<sup>a,b</sup>

<sup>a</sup>Center on Alcoholism, Substance Abuse, & Addictions, 2650 Yale Blvd SE, Albuquerque, NM 87106, USA

<sup>b</sup>University of New Mexico, Logan Hall MSC03-2220, 1 University of New Mexico, Albuquerque, NM 87131, USA

### Abstract

Motivational Interviewing (MI) is an evidenced-based intervention designed to help clients explore and resolve ambivalence around substance use. MI combines a humanistic tradition with behavioral components to facilitate client decisions concerning behavior change. As such, there is marked interest in the relationship between the two active ingredients of MI – the relational, or person-centered, components and the technical, or directional, behavioral components – on client in-session language. Yet, few studies have examined how these active ingredients operate in concert. Therefore, the current study evaluated the constellation of relational skills associated with client language, as well as the influence of technical skills on the relationship between provider relational skills and client change language. Specifically, we tested a latent construct of relational skill and its direct association with the proportion of client change talk. We then explored the mediating role of reflections of change and sustain talk (RefCT and RefST) on this relationship. The data for this secondary analysis are from Project ELICIT ( $N=131$ ), a randomized control trial evaluating the effects of MI training on client change language. We found support for a latent construct of relational skill (i.e., empathy, acceptance, collaboration, and autonomy/support). However, the relational skill construct did not predict client change language. There was support for an indirect effect, such that relational skills predicted RefCT and RefST, and RefCT and RefST predicted client change language. These results suggest that the synergistic implementation of the relational and technical components of MI is critical to facilitating a higher percentage of change talk.

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\*Corresponding Author: Center on Alcoholism, Substance Abuse, & Addictions, University of New Mexico, 2650 Yale Blvd SE, MSC11-6280, Albuquerque, NM 87106, 505.925.2371.

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## Keywords

Motivational Interviewing; Implementation; Active Ingredients; Client Language; Substance use

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## 1. Introduction

Substance use disorders are the most prevalent psychiatric disorders in the United States, affecting approximately 20 million adults (Center for Behavioral Health Statistics and Quality, 2015). Motivational interviewing (MI) is an evidenced-based intervention designed to help clients to explore and resolve their ambivalence toward changing their substance use (Miller & Rollnick, 2013). A particularly appealing feature of MI is its ability to achieve positive outcomes in relatively few sessions in contrast to other evidence-based substance use treatments (Hettema, Steele, & Miller, 2005). The efficacy of MI has led to its broad implementation across treatment settings and with clients presenting with a range of substance use and other health-related behaviors. Further, hundreds of empirical studies and several meta-analytic reviews have supported MI, finding small to moderate effects on client outcomes (e.g., Cushing, Jensen, Miller, & Leffingwell, 2014; Lundahl, Kunz, Brownwell, Tollefson, & Burke, 2010). Despite this support in the empirical literature, the effectiveness of MI is hardly straightforward. The fact that it demonstrates quite variable effect sizes in similar projects, shows prominent site effects in multi-site trials, and that null findings are not infrequent may indicate that the treatment cannot or is not being used in a manner that consistently employs the active ingredients that account for success. This concern surrounding the varying effects of MI on substance use outcomes has led to more fine-grained investigations of the therapeutic processes within this therapeutic method (Miller & Moyers, 2014).

### 1.1 Theory of MI Efficacy

The utility of MI is hypothesized to stem from the unique integration of behavioral skills within a person-centered style to facilitate client decisions around change. Miller and Rose (2009) identified two active ingredients of MI – relational and technical – that comprise the necessary provider MI skills to facilitate client motivation and commitment to change. The effective utilization and integration of skills from these two components facilitates client in-session language and subsequent treatment outcomes (Miller & Rose, 2009). Client in-session language is a theorized mechanism of action that links the active ingredients of MI to treatment outcomes. Client language refers broadly to how a client articulates his/her desire to change a target behavior in-session, and includes statements in favor of change, or change talk (e.g., “I need to quit drinking”) and statements in favor of existing behaviors, or sustain talk (e.g., “Drinking helps me relax”; Miller & Rollnick, 2013).

There is growing support for the technical and relational components as active ingredients (i.e. therapeutic skills/processes of the provider that is related to client in-session language) of MI efficacy (Romano & Peters, 2016), and client in-session language as a mechanism of action (i.e. process/behavior within/enacted by the client that is related to client outcome) (Moyers, Martin, Houck, Christopher, & Tonigan, 2009; Pirlott, Kisbu-Sakary, DeFrancesco, Elliot, & MacKinnon, 2012). Yet, the literature on the association between active MI

ingredients and client in-session language points to a need to consider the combined effects of these ingredients on MI efficacy.

## 1.2 Active Ingredients of MI

The technical component of MI comprises specific provider behaviors that are intended to evoke and reinforce client language, and the relational component is intended to engage the client by fostering a collaborative relationship, supporting client autonomy, and facilitating rather than prescribing client motivation to change, within a context of provider empathy and acceptance (Moyers, 2014). Of MI's posited active ingredients, the technical component has received more empirical attention given the interest in whether specific MI behaviors designed to predict client change language actually predicts such language (e.g., reflections of client change talk → client change talk). Two recent meta-analyses supported the technical component as an active ingredient of MI, such that specific MI behaviors predict the proportion of change talk to sustain talk (i.e., CT/CT+ST), which in turn predicts treatment outcomes (Magill et al., 2014, 2018). There has been mixed support, however, for the relational component as an active ingredient of MI (Apodaca & Longabaugh, 2009; Moyers, Houck, Rice, Longabaugh, & Miller, 2016). Based on meta-analyses of the two most commonly examined relational skills (i.e., MI spirit [collaboration, autonomy support, evocation] and empathy), Magill and colleagues (2018) did not find support for the relational component, whereas Pace et al (2017) found these relational skills were positively associated with client change language. In a larger systematic review that included the constellation of relational skills, Romano and Peters (2016) found differential associations between distinct relational skills and client language. These studies highlight the inconsistency in how the relational component is operationalized, as well as the uncertainty about the influential role of the provider's general relational skill during an MI session.

One potential explanation for these inconsistent findings is that prior investigations focused on the association between distinct relational skills and client language. Conceptually, Miller and Rollnick (2013) outline that provider level of empathy and acceptance toward the client are critical components of adherence to MI spirit. More specifically, providers who create an atmosphere of understanding and support will more readily engage clients in a collaborative conversation about change that is consistent with each client's goals. Thus, the constellation of relational skills may be a prerequisite for client engagement in session and subsequent commitment to change (Miller & Rollnick, 2013). Empirically, only one study to date has examined the comprehensive utilization of relational skills on client engagement in MI. Moyers, Miller, and Hendrickson (2005) evaluated the multidimensionality of provider relational skills, comprising acceptance, egalitarianism, empathy, warmth, and spirit, on client involvement. They found that provider relational skills, when aggregated in this way, predicted more client involvement in psychotherapy. Interestingly, the researchers also found an interaction effect between relational skills and technical skills, such that the association between relational skills and client involvement was strengthened when providers used more MI-inconsistent (MIIN) behaviors, such as being direct with or confronting the client. Although contrary to expectations, these findings underscore the importance of the provider's relational skills with a client during an MI session.

### 1.3 Evaluation of MI

To evaluate both active ingredients (technical and relational) and mechanisms of action (client in-session language) in MI, researchers primarily use observationally-rated tools, such as the Motivational Interviewing Skills Code (MISC; Miller, 2000). The MISC was designed to evaluate MI fidelity, provider use of MI-consistent behaviors (MICO) and interpersonal style, and client statements surrounding behavior change. MICO behaviors, such as asking open questions or reflecting client change statements, are counted, whereas interpersonal style, such as empathy and acceptance, are global ratings based on provider behavior throughout an MI session. Morgenstern and colleagues (2012; 2018) categorized behavior counts and global ratings as ‘technical’ if they were directional (e.g., evocation; double-sided) and ‘relational’ if they were non-directional (e.g., autonomy support; simple reflection). The current study is conceptually similar in that our constellation of relational skills are meant to be non-directional (not focused on eliciting client change talk), but distinct in that we are focused on the non-directional ‘global ratings’ of the provider throughout the MI session. Of note, despite the potential overlap between specific behaviors and global indicators of relational skills during an MI session, the conceptual distinction is based on the *way* a provider articulates certain statements. For example, a provider can offer reflective statements in a manner that lacks empathy or understanding.

The current version of the MISC (MISC 2.5; Houck, Moyers, Miller, Glynn, & Hallgren, 2010) further elucidates the distinction between global indicators of relational skills and specific MICO behaviors. For example, provider reflective statements are separated based on valence: the direction of provider statements toward or away from changing the target behavior (Moyers et al., 2009). Whereas provider reflections of change talk and sustain talk (RefCT and RefST) appear to evoke more client change talk or more client sustain talk, respectively (e.g., Houck & Moyers, 2015), the emphasis on the direction of the reflective statements may lead novice providers to neglect the foundational spirit of MI (i.e., relational skills) in an effort to get change talk. It is important to investigate the synergistic effects of both *what* (i.e., technical) and *how* (i.e., relational) the provider communicates during an MI session to influence client engagement in their own change efforts.

### 1.4 Purpose of Study

Effective MI providers can establish a supportive, egalitarian therapeutic environment, as well as elicit and reinforce client decisions favoring change in problematic health behaviors. Miller and Rose (2009) outlined a theoretical model of MI that offers a solid foundation for how MI works. Despite evidence that specific MI skills predict client language, findings have inconsistently supported the link between the provider’s relational skills and client language. It may be that the constellation of relational skills, *in association with specific technical skills* predicts client change talk. Therefore, the purpose of the current study is to evaluate the collection of relational skills and their association with client in-session language. First, we evaluated the factor structure of MI relational skills, hypothesizing that provider relational skills (i.e., empathy, acceptance, collaboration, and autonomy support) will load on a single factor of relational skill. Second, we tested the extent to which the relational skill construct predicted client in-session language. We hypothesized a positive association between relational skill and proportion of change talk. Finally, we explored the

mediating role of two MI technical skills on the relationship between relational skills and proportion of client change talk. Given our attention to the proportion of change talk, which takes into account the amount of client change talk and sustain talk, we included the frequency of provider reflections of both change talk and sustain talk as mediators (RefCT and RefST). We hypothesized that more RefCT and fewer RefST will account for the positive relationship between relational skill construct and proportion of client change talk.

## 2. Material and methods

The current study used data from Project ELICIT, a randomized controlled trial testing the effectiveness of specific types of MI training on eliciting more client change talk and less client sustain talk. This study was approved and overseen by the University of New Mexico Institutional Review Board. All providers granted written informed consent for participation prior to engaging in the study. As the focus of this study was to evaluate elicitation of change talk by providers across different MI training conditions, data from clients, excepting the audiotaped samples, were not collected. All providers agreed to provide five work samples per measurement occasion: baseline, post-training, and three, six, and twelve months following training.

### 2.1. Participant selection

Providers wishing to participate in the study were screened for the following eligibility criteria: being employed as a substance use counselor in a public or not for profit context, having less than eight hours of previous training in MI, and willing to travel to the study location for training. Further, to avoid problems with cross-contamination, only one participant per site was allowed to enroll in the parent study. A complete description of sample characteristics and the randomization process into MI training conditions are described elsewhere (Moyers, Houck, Glynn, Hallgren, & Manuel, 2017). Specific to the current study, 131 providers completed one of the MI training conditions and provided at least one work sample three months following training. Work samples were unstructured (i.e., non-manualized) MI sessions targeting substance use behavior, lasting an average of 46 minutes ( $M = 46.05$ ,  $SD = 9.45$ ), and only included clients with whom the provider had seen for fewer than six individual sessions, the majority of which were session one or two of MI (75.6%). No roleplays, “realplays”, or work with standardized patients were included in the sample.

### 2.2. Coding and Parsing

The Motivational Interviewing Skills Code (MISC 2.5; Houck et al. 2010) was used by raters to code the audiotaped work samples. The MISC 2.5 is a comprehensive method of coding provider and client verbal behavior that has been identified as important in the process of motivational interviewing. The MISC 2.5 differs from previous versions of the MISC in that it combines facets of both the MISC 2.1 (Miller, Moyers, Ernst, & Amrhein, 2003) and the Motivational Interviewing Sequential Code for Observing Process Exchanges (MI-SCOPE; Martin, Moyers, Houck, Christopher, & Miller, 2005). The combination of these two coding systems provided the opportunity to evaluate the direction of both client and provider utterances within MI sessions. The MISC 2.5 includes codes for rater

impressions of client and provider behavior on both the global level and on an individual behavior level. Specifically, raters assign codes that are specific to each utterance, permitting the evaluation of the temporal sequence of client and provider utterances. This provides information related to the direction of reflections the provider is using within the session rather than gross counts of simple and complex reflections.

Audio-recorded samples were parsed and coded using the CASAA Application for Coding Treatment Interactions (CACTI) software (Glynn, Hallgren, Houck, & Moyers, 2012). CACTI software is an open-source, sequential-coding program designed specifically to use with sequential coding systems like the MISC 2.5. Coding and parsing with CACTI software occurred in two passes. In the first pass, audio-recordings were parsed into individual client and provider utterances and raters assigned global ratings of provider behaviors. In the second pass, a separate group of raters assigned behavior codes to the individual client and provider utterances.

The MISC 2.5 comprises six global ratings of provider skills – empathy, acceptance, collaboration, evocation, autonomy/support, and direction – that are scored on a 5-point Likert scale, with higher ratings indicating more of a characteristic (e.g., a rating of 5 indicates high levels of acceptance). The current study evaluated empathy, acceptance, collaboration, and autonomy/support given that these ratings are more indicative of the relational component of MI (see Table 1 for rating descriptions and verbal anchors). Of note, we recognize that prior investigations of the relational component of MI includes ‘evocation’ in the conceptualization (Moyers, Martin, Manuel, Hendrickson, & Miller, 2005). For the current study, we chose to conceptualize relational skills in a manner that is consistent with Morgenstern et al (2012; 2018) such that only non-directive, global indicators of relational skills were included in our analyses.

In contrast to the gestalt view of global behaviors, behavior codes indicate only that a specific utterance in the session corresponds to a particular behavior. Behavior codes can be summed to produce counts of each behavior. The MISC 2.5 includes 17 separate behavior codes for provider behavior with both simple and complex reflections receiving additional codes identifying the valence of the utterance (e.g. reflections of sustain or change talk). Reflections of change talk (RefCT) are characterized by reflective statement(s), either simple or complex, that “gives back” the language to a client in a way that emphasizes the client’s desire to change. Reflections of sustain talk (RefST) are characterized by reflective statements which emphasize the client’s desire to maintain the status quo (i.e., not change). Finally, the 15 separate MISC 2.5 client behavior counts can be summarized to capture three broad categories of client language: follow/neutral/ask, change talk, and sustain talk. Percentage of change talk (PCT) was used as the outcome variable in the current study. PCT is computed as the total number client utterances containing CT divided by the total utterances of CT and ST (i.e.,  $CT/(CT+ST)$ ). Utilization of PCT over total client utterances of CT has the advantage of characterizing CT as a ratio that is not dependent on session length and may be more informative than absolute counts (Miller, 2000).



## 2.3 Rater training

Independent raters for this study were nine students, seven graduate and two undergraduate, from the University of New Mexico. Training for raters included classroom style didactic education in the MISC 2.5 coding system as well as structured practice samples and weekly meetings. Intraclass correlations (ICC) for the raters in the study were required to be greater than 0.6 before rating study recordings. Of the 609 submitted work samples, 72 recordings were randomly selected for double coding by the six coders who completed the majority of all recordings. Using ICC guidelines outlined by Cicchetti (1994), reliability estimates ranged from “poor, fair, good” to excellent across the six coders for both global ratings and behavior counts (see Table 2).

## 2.4 Analysis Plan

Model building and mediation analyses were conducted in Mplus version 8 (Muthén & Muthén, 1998–2017). Confirmatory factor analysis (CFA) was used to estimate the measurement model of relational skill by the global indicators of empathy, acceptance, collaboration, and autonomy/support. As latent variables are unmeasured, the units of measurement must be fixed. To satisfy this requirement, we chose to fix the loading of autonomy/support to 1.0 in the CFA. Initial screening of the global behavior indicators revealed a normal distribution and as such, the indicators were modeled as continuous. Model fit pre-specification levels for the measurement model were determined by a non-significant  $\chi^2$ , RMSEA .08, and a CFI .90 (Kline, 2011). The Full Maximum Likelihood estimator was used in Mplus and the number of starting iterations was set to 1,000. Mediation analyses were conducted with counts of RefCT and RefST entered simultaneously as mediators explaining the effect of relational skills on PCT. Given the potential for suppression effects when including multiple mediators that are anticipated to have opposite effects (i.e., RefCT would predict more PCT, whereas RefST would predict less PCT), we also conducted two simple mediation analyses to evaluate the independent effects of each mediator on the association between relational skill construct and PCT. A bootstrapping technique was used to obtain effect size estimates of the mediational effects from 10,000 resamples while accounting for non-normality in the data (Preacher & Hayes, 2004). Significant mediation is indicated if bootstrap confidence intervals of indirect parameter estimates do not include zero (Preacher & Kelley, 2011).

## 3. Results

### 3.1. Measurement model of relational skill

Based on the specifications for model fit, the latent model of relational skill provided an excellent fit  $\chi^2(2) = 3.19$ , RMSEA = 0.07, and CFI = .99. As our  $\chi^2$  is non-significant, we can conclude that the estimated variance covariance matrix does not significantly differ from the observed variance covariance matrix (available upon request), and thus conclude that the data fit the hypothesized model.

### 3.2. Relational skill mediated by technical skills

All paths for the full process model are illustrated in Figure 1 with corresponding beta weights and a correlation matrix displaying bivariate relationships between variables is presented in Table 3. Model fit statistics indicated an excellent fit of the data to the hypothesized model,  $\chi^2(11) = 10.32$ , RMSEA = 0.00 (90% CI [0.00, 0.09]), and CFI = 1.00. The total effect ( $c'$ ) of percent change talk (PCT) when regressed on the latent variable of relational skill was not significant,  $\beta = 0.06$ , (90% CI [-0.00, 0.11]). Likewise, the total indirect effect of RefCT and RefST were not significant,  $\beta = 0.02$ , (90% CI [-0.03, 0.03]). The specific indirect effect through RefST was not significant ( $a^2b^2$ ),  $\beta = -0.03$ , (90% CI [-0.05, -0.02]). However, the specific indirect effect of relational skill construct through RefCT on PCT was significant ( $a^1b^1$ ),  $\beta = 0.04$ , (90% CI [0.02, 0.12]). Thus, relational skill construct predicted an increase in RefCT ( $\beta = .36$ ,  $p < .001$ ), and RefCT predicted an increase in PCT ( $\beta = .28$ ,  $p < .001$ )<sup>1</sup>. We also conducted two simple mediation analyses with RefCT and RefST entered separately as mediators given the potential for suppression effects when including multiple mediators with opposite anticipated effects. Evaluation of the two simple mediation models did not indicate significant mediation for either model for either total or indirect effects. Of note, we also found an indirect effect of RefCT when we calculated it as a proportion of all reflections counted in the session (i.e., RefCT/all reflections = PRCT). Specifically, model fit statistics were adequate,  $\chi^2(8) = 14.01$ , RMSEA = 0.08 (90% CI [0.00, 0.14]), and CFI = .96, and the specific indirect effect through PRCT was significant,  $\beta = 0.07$ , (90% CI [0.01, 0.16]). Relational skill construct predicted an increase in PRCT ( $\beta = .23$ ,  $p < .05$ ), and PRCT predicted an increase in PCT ( $\beta = .30$ ,  $p < .001$ ).

### 3.3. Exploratory Follow-up Analyses

Given the different methods for evaluating relational skills (global rating) versus specific technical skills and client statements (behavior counts), as well as the reciprocal influences of different provider skills and their effects on client language during an MI session, we conducted a series of exploratory follow-up analyses. First, we tested whether the relational skill construct moderated the association between RefCT and RefST and PCT. Relational skill did not moderate the association between RefCT ( $\beta = -0.007$ ,  $p = 0.107$ ), nor RefST ( $\beta = -0.014$ ,  $p = 0.305$ ) and PCT. Second, we explored whether relational skill mediated the association between the two specific technical skills and PCT. Despite excellent model fit, relational skill construct did not mediate the effect of RefCT or RefST on PCT (RefCT:  $\beta = 0.001$ ,  $p = 0.371$ ; RefST:  $\beta = 0.000$ ,  $p = 0.476$ ). Finally, to increase confidence in our current proposed model, we re-ran our mediation model with the mediator and criterion variables switched (*cf.* Sheets & Braver, 1999). A reverse mediation model provided excellent model fit based on pre-specified criteria; however, substantive mediation results did not change.

<sup>1</sup>To address the possibility that session number would significantly influence the mediation results, we included session number as a covariate in all analyses. Results with session added as a covariate did not indicate significant changes in model fit indices or substantive mediation results.



## 4. Discussion

This study tested a latent construct of relational skill, as well as its association with specific technical skills on client change talk. Using data derived from a randomized clinical training trial, we found support for conceptualizing the relational component as a constellation of relational skills, comprising empathy, acceptance, collaboration, and autonomy/support. Surprisingly, the relational component did not predict client change language at three months post-training. However, there was an indirect effect of the relational component on client change language through specific technical MI skills. The relational skill construct predicted more reflections of change talk, whether calculated as a count variable (RefCT) or as a proportion of all provider reflections (PRCT), and reflections of change talk predicted more client change talk. The relational component appears to be necessary but not sufficient to resolve client ambivalence. Thus, the synergistic implementation of the relational and technical components of MI is critical to facilitating a higher percentage of change talk.

The constellation of relational skills that comprise the relational component is hypothesized to be critical to understanding *why* MI works. In fact, Miller and Rollnick (2013) stated that, “without this underlying spirit, MI becomes a way of trying to manipulate people into doing what they don’t want to do” (pp. 14). Although prior MI studies tended to evaluate specific relational skills rather than their combination, the MI-emphasis of provider interpersonal style across psychotherapeutic interventions is consistent with the large body of research on the common factors, such as the therapeutic alliance. An engaging, relational therapeutic style is consistently associated with forming a strong working alliance and subsequent treatment outcomes, particularly in short-term therapies (Heinonen et al., 2014). Taken together, the collection of relational skills 1) more accurately embodies the person-centered therapeutic style and the spirit of MI and 2) complements the use technical MI skills to increase client talk.

The current study tested the extent to which the relational component predicted client change language. Although we did not find a direct association between relational skill and client change language, our mediation model showed that the relational skill construct was associated with specific MI technical skills, which were associated with an increased proportion of client change talk. Tentatively, these findings are reflective of the ‘necessary, but not sufficient’ sentiment found in research comparing the effects of technical skills and common factors on treatment efficacy (Wampold, 2001). Although the relational component of MI includes skills that are common across evidence-based substance use treatments, the relational component is also explicitly hypothesized as an active ingredient that serves as the foundation to permit the effective use of technical skills in an MI session (Moyers, 2014). The findings in the current study are consistent with this, suggesting that fostering a supportive, egalitarian atmosphere, without the inclusion of technical MI skills, may prevent the client and provider from fully exploring what change may look like. In building a bond through relational skills, the provider facilitates the offering of change talk by the client, and therefore opportunities for the provider to recognize, respond to, and elicit more of it.

The current findings offer some important considerations for the implementation of MI. First and foremost, recognizing both the relational and technical components as active ingredients

of MI and training providers to use these skills in a complementary and integrative fashion are critical to the effective delivery of MI, and ultimately to client success. Consistent with this, a recent meta-analysis conducted by Magill et al. (2018) found the effective implementation of technical MI skills on client in-session language (*a* path) was partially, albeit weakly, accounted for by two relational skills (empathy and MI spirit). Future implementation research may benefit from incorporating and evaluating exercises that entail observing/identifying, practicing, and rating specific behaviors that are consistent with the constellation of relational skills to assist providers in integrating the active ingredients of MI.

The current study's findings must be viewed in light of the limitations. First, Project ELICIT was designed to test the effects of MI training on client in-session language. Clients were not participants in the study and their pre-treatment (e.g., motivation) or outcome (e.g., substance use behaviors) data were not obtained, preventing us from testing the theorized causal model of MI (Miller & Rose, 2009). Future research replicating current findings and evaluating the impact on client outcomes is needed. Second, although separate raters evaluated global and specific MI behaviors of the provider, the potential overlap between empathy broadly and reflective statements specifically may reflect a specific relational skill that is needed to elicit client change language. Future work would benefit from identifying which behavioral counts correspond with global indicators to better determine their collective impact on client engagement in session. Additionally, we did not evaluate the extent of provider self-disclosure in the current study. Prior work has identified specific types and levels of self-disclosure that can negatively affect MI efficacy (Martino, Ball, Nich, Frankforter, & Carroll, 2009). Thus, future work may consider such behaviors to help clarify the impact of provider behaviors on client engagement in MI. Also, despite the widespread use of the MISC to evaluate provider skills and client language, this measure is limited in its ability to capture other key features of the relational component, such as provider, nature, tone and demeanor. Future work should design instruments to capture such interpersonal features. Third, Moyers et al. (2005) found positive associations between provider relational skills and client engagement, defined as cooperation, disclosure, and expression of affect. Although these client factors could lend themselves to client change talk, it could also be that provider relational skills are simply indirectly associated with client and provider facilitative factors and not directly associated with client change talk. Fourth, Moyers et al. (2005) findings include components of provider relational skills (i.e. acceptance, egalitarianism, empathy, warmth, and spirit) that were not measured in the current study and therefore could not be directly replicated. This further illustrates the importance of modeling relational skills as an aggregate of all measurable dimensions rather than parsing out individual sets of skills. Finally, we did not evaluate changes in provider and client utterances across session segments (e.g., deciles). Future work should consider which MI skills may be beneficial at the start vs. the end of an MI session to elicit client change language.

Moving forward, evaluating the effective implementation of active ingredients of MI and how they differentially influence mechanisms of behavior change and predict treatment outcomes may entail manipulating the type of client language a provider evokes (change vs. sustain talk), and evaluating whether the active ingredients differentially predict different

types of client language. Experimental training paradigms like Project ELCIT can help identify the critical and adaptive features necessary for effective implementation. Relatedly, broadening our conceptualization of client change statements as a mechanism of behavior change may inform how to improve MI training, with particular attention to when the provider should incorporate directive, strategic statements in their person-centered therapeutic style. For example, Magill et al. (2016) developed a client language rating tool meant to capture the larger decision-making process, including client statements about proximal (i.e., coping strategies to aid in behavior change) and distal (i.e., target behavior change) behaviors. The uncertainty surrounding client change language as an actual mechanism of behavior change or an indicator of another mechanism at work points to the need for identification and incorporation of alternative, related mechanisms (e.g., client autonomy). Also, coding relational provider utterances and evaluating their association to client language can mitigate the potential confound of a global indicator of relational skill. Preliminary work has found empathic utterances predict client language (Fischer & Moyers, 2014), offering a novel direction for translating relational skills into specific provider statements in MI process research. Finally, one other study, to our knowledge, has measured the proportion of reflections of change talk (PRCT) in association with client change language and treatment outcomes (Barnett et al., 2014). Our findings were consistent with these researchers in that PRCT predicted more PCT, and Barnett and colleagues (2014) also found PRCT predicted marijuana use outcomes. Thus, future researchers may benefit from measuring provider MI skills in various ways, as has been done with client language (Gaume et al., 2016), to determine their impact on client language and subsequent outcomes.

## 5.1 Conclusions

Overall, the current study highlights the importance of the MI provider's ability to integrate relational and technical skills to selectively evoke client change talk and soften sustain talk. Given the wealth of literature linking the therapeutic relationship to working alliance and treatment outcomes, for both MI and other evidence-based therapeutic interventions, additional research on the implementation of the relational component on mechanisms of change and treatment effects is warranted. Importantly, placing equal weight on the array of relational skills comprising the relational component will be critical for providers to truly value the spirit of MI as well as effectively implement the technical MI skills during sessions.

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## 5. References

Apodaca TR, & Longabaugh R (2009). Mechanisms of change in motivational interviewing: A review and preliminary evaluation of the evidence. *Addiction*, 104, 705–715. doi: 10.1111/j.1360-0443.2009.02527.x [PubMed: 19413785]

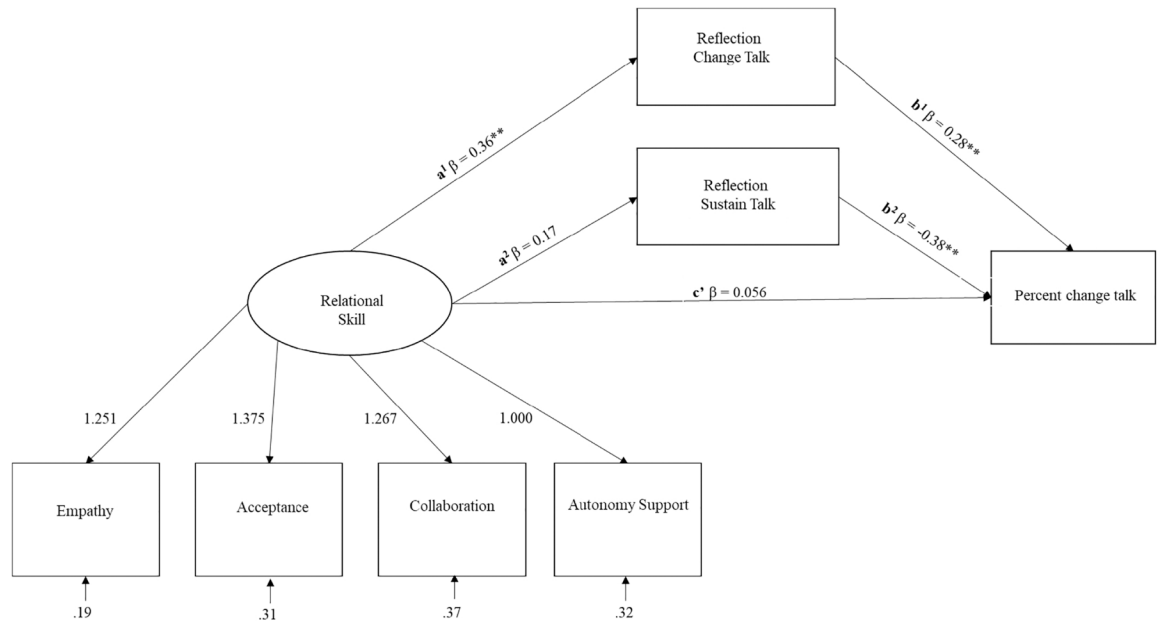
- Barnett E, Moyers TB, Sussman S, Smith C, Rohrbach LA, Sun P, & Spruijt-Metz D (2014). From counselor skill to decreased marijuana use: Does change talk matter? *Journal of Substance Abuse Treatment*, 46, 498–505. [PubMed: 24462244]
- Center for Behavioral Health Statistics and Quality. (2015). Behavioral health trends in the United States: Results from the 2014 National Survey on Drug Use and Health (HHS Publication No. SMA 15–4927, NSDUH Series H-50). Retrieved from <http://www.samhsa.gov/Data/>
- Cicchetti DV (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment*, 6, 284–290. doi: 10.1037/1040-3590.6.4.284
- Cushing CC, Jensen CD, Miller MB, & Leffingwell TR (2014). Meta-Analysis of Motivational Interviewing for Adolescent Health Behavior: Efficacy Beyond Substance Use. *Journal of Consulting and Clinical Psychology*. <https://doi.org/10.1037/a0036912>
- Fischer DJ, & Moyers TB (2014). Is there an association between empathic speech and change talk in motivational interviewing sessions? *Alcoholism Treatment Quarterly*, 32, 3–18. doi: 10.1080/07347324.2014.856225
- Gaume J, Magill M, Mastroleo NR, Longabaugh R, Bertholet N, Gmel G, & Daeppen JB (2016). Change talk during brief motivational intervention with young adult males: Strength matters. *Journal of Substance Abuse Treatment*, 65, 58–65. [PubMed: 26947118]
- Glynn LH, Hallgren KA, Houck J, & Moyers TB (2012). CACTI: Free, open-source software for the sequential coding of behavioral interactions. *PLoS ONE*, 7, e39740 Retrieved from <http://dx.doi.org/10.1371/journal.pone.0039740> [PubMed: 22815713]
- Heinonen E, Lindfors O, Harkanen T, Virtala E, Jaaskelainen T, & Knekt P (2014). Therapists' professional and personal characteristics as predictors of working alliance in short-term and long-term psychotherapies. *Clinical Psychology and Psychotherapy*, 21, 475–494. doi: 10.1002/cpp.1852 [PubMed: 23813617]
- Hettema J, Steele J, & Miller WR (2005). Motivational interviewing. *Annual Review in Clinical Psychology*, 1, 91–111. doi: 10.1146/annurev.clinpsy.1.102803.143833
- Houck JM, & Moyers TB (2015). Within-session communication patterns predict alcohol treatment outcomes. *Drug and Alcohol Dependence*, 157, 205–209. doi: 10.1016/j.drugalcdep.2015.10.025 [PubMed: 26573732]
- Houck JM, Moyers TB, Miller WR, Glynn LH, & Hallgren KA (2010). Motivational interviewing skill code (MISC) version 2.5. Retrieved from <http://casaa.unm.edu/download/misc25.pdf>
- Kline RB (2011). *Principles and practice of structural equation modeling*. New York, NY: Guilford.
- Lundahl BW, Kunz C, Brownell C, Tollefson D, & Burke BL (2010). A Meta-Analysis of Motivational Interviewing: Twenty-Five Years of Empirical Studies. *Research on Social Work Practice*, 20(2), 137–160. <https://doi.org/10.1177/1049731509347850>
- Magill M, Apodaca TR, Borsari B, Gaume J, Hoadley A, Gordon REF, ... Moyers T (2018). A meta-analysis of motivational interviewing processes: Technical, relational, and conditional process models of change. *Journal of Consulting and Clinical Psychology*, 86, 140–157. doi: 10.1037/ccp0000250 [PubMed: 29265832]
- Magill M, Apodaca TR, Karno M, Gaume J, Durst A, Walthers J, Stout RL, & DiClemente C (2016). Reliability and validity of an observational measure of client decision-making: The client language assessment – proximal/distal (CLA-PD). *Journal of Substance Abuse Treatment*, 63, 10–17. doi: 10.1016/j.jsat.2015.12.006 [PubMed: 26898715]
- Magill M, Gaume J, Apodaca TR, Walthers J, Mastroleo NR, Borsari B, & Longabaugh R (2014). The technical hypothesis of motivational interviewing: A meta-analysis of MI's key causal model. *Journal of Consulting and Clinical Psychology*, 82, 973–983. doi: 10.1037/a0036833 [PubMed: 24841862]
- Martin T, Moyers TB, Houck JM, Christopher PJ, & Miller WR (2005). Motivational interviewing sequential code for observing process exchanges (MI-SCOPE) coder's manual. Retrieved from <http://casaa.unm.edu/download/scope.pdf>
- Martino S, Ball SA, Nich C, Frankforter TL, & Carroll KM (2009). Informal discussions in substance abuse treatment sessions. *Journal of Substance Abuse Treatment*, 36, 366–375. [PubMed: 18835679]

- Miller (2000). Motivational interviewing skill code (MISC) version 1.0. Retrieved from <http://casaa.unm.edu/download/misc1.pdf>
- Miller WR, & Moyers TB (2014). The forest and the trees: Relational and specific factors in addiction treatment. *Addiction*, 110, 401–413. doi: 10.1111/add.12693 [PubMed: 25066309]
- Miller WR, Moyers TB, Ernst D, & Amrhein P (2003). Manual for the motivational interviewing skill code (MISC) manual (Version 2.1). Retrieved from <https://casaa.unm.edu/download/misc.pdf>.
- Miller WR, & Rollnick S (2013). *Motivational interviewing: Preparing people for change*. (3rd ed.). New York, NY: Guilford Press.
- Miller WR, & Rose GS (2009). Toward a theory of motivational interviewing. *American Psychologist*, 64, 527–537. doi: 10.1037/a0016830 [PubMed: 19739882]
- Moyers TB (2014). The relationship in motivational interviewing. *Psychotherapy*, 51, 358–363. doi: 10.1037/a0036910 [PubMed: 25068193]
- Moyers TB, Houck J, Glynn LH, Hallgren KA, & Manuel JK (2017). A randomized controlled trial to influence client language in substance use disorder treatment. *Drug and Alcohol Dependence*, 172, 43–50. doi: 10.1016/j.drugalcdep.2016.11.036 [PubMed: 28122270]
- Moyers TB, Houck J, Rice SL, Longabaugh R, & Miller WR (2016). Therapist empathy, combined behavioral intervention and alcohol outcomes in the COMBINE research project. *Journal of Consulting and Clinical Psychology*, 84, 221–229. doi: 10.1037/ccp0000074 [PubMed: 26795938]
- Moyers TB, Martin T, Houck JM, Christopher PJ, & Tonigan JS (2009). From in-session behaviors to drinking outcomes: A causal chain for motivational interviewing. *Journal of Consulting and Clinical Psychology*, 77, 1113–1124. doi: 10.1037/a0017189 [PubMed: 19968387]
- Moyers TB, Martin T, Manuel JK, Hendrickson SML, & Miller WR (2005). Assessing competence in the use of motivational interviewing. *Journal of Substance Abuse Treatment*, 28, 19–26. [PubMed: 15723728]
- Moyers TB, Miller WR, & Hendrickson SML (2005). How does motivational interviewing work? Therapist interpersonal skill predicts client involvement within motivational interviewing sessions. *Journal of Consulting and Clinical Psychology*, 73, 590–598. doi: 10.1037/0022-006X.73.4.590 [PubMed: 16173846]
- Muthén LK, & Muthén BO (2017). *M-plus statistical analysis with latent variables user's guide* (8th ed.). Los Angeles, CA: Muthén & Muthén.
- Pace BT, Demebe A, Soma CS, Baldwin SA, Atkins DC, & Imel ZE (2017). A multivariate meta-analysis of motivational interviewing process and outcome. *Psychology of Addictive Behaviors*, 31, 524–533. [PubMed: 28639815]
- Pirlott A, Kisbu-Sakarya Y, DeFrancesco C, Elliot D, & MacKinnon D (2012). Mechanisms of motivational interviewing in health promotion: A Bayesian mediation analysis. *International Journal of Behavioral Nutrition and Physical Activity*, 9, 1–11. doi: 10.1186/1479-5868-9-69 [PubMed: 22233712]
- Preacher KJ, & Hayes AF (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40, 879–891. doi: 10.3758/BRM.40.3.879 [PubMed: 18697684]
- Preacher KJ, & Kelley K (2011). Effect size measures for mediation models: Quantitative strategies for communicating indirect effects. *Psychological Methods*, 16, 93–115. doi:10.1037/a0022658 [PubMed: 21500915]
- Romano M, & Peters L (2016). Understanding the process of motivational interviewing: A review of the relational and technical hypotheses. *Psychotherapy Research*, 26, 220–240. doi: 10.1080/10503307.2014.954154 [PubMed: 25204407]
- Sheets VL, & Braver SL (1999). Organizational status and perceived sexual harassment: Detecting the mediators of a null effect. *Personality and Social Psychology Bulletin*, 25, 1159–1171.
- Wampold BE (2001). *The great psychotherapy debate: Models, methods and findings*. Mahwah, NJ: Erlbaum.

### Highlights

- Motivational interviewing (MI) comprises two components (relational & technical)
- Client change language is a theorized mechanism of action in MI
- Technical, but not relational MI skills predicted client change language
- Relational MI skills facilitate the implementation of technical MI skills





**Figure 1.** Estimates of relational skills on client percent change talk through reflections of change talk and reflections of sustain talk.

**Table 1.**

## Description and Verbal Anchors of Provider Global Ratings

Global	Description	Verbal Anchors	
		Low Rating (1)	High Rating (5)
Acceptance	The extent the clinician communicates unconditional positive regard for the client	Clinician's behavior shows obvious and explicit disregard toward the client	Clinician's behavior implies acceptance, and makes clear and explicit expressions of positive regard for the client.
Empathy	The extent the clinician understands and/or makes an effort to accurately understand the client's perspective.	Clinician has no apparent interest in client's worldview. Gives little or no attention to the client's perspective.	Clinician shows deep understanding of client's point of view, not just for what has been explicitly stated but what the client means and has not said.
Autonomy/Support	The extent the clinician supports and actively fosters client perception of choice as opposed to attempting to control the client's behavior or choices.	Clinician actively detracts from or denies client's perception of choice or control.	Clinician adds significantly to the feeling and meaning of client's expression of autonomy that markedly expand client's experience of own control and choice.
Collaboration	The extent the clinician behaves as if the interview is occurring between two equal partners, both of whom have knowledge that might be useful in the problem under consideration.	Clinician actively assumes the expert role for the majority of the interaction with the client.	Clinician actively fosters and encourages power sharing in the interaction that the client's ideas substantially influence the direction and outcome of the session.

**Table 2.**

## Descriptive statistics and reliability

	Session Mean	SD	Range	Proportion <sup>a</sup>	ICC
<b>Provider</b>					
Acceptance	3.86	0.81	3	-	.79
Empathy	3.76	0.69	3	-	.75
Collaboration	3.27	0.81	4	-	.80
Autonomy Support	3.40	0.71	3	-	.78
Reflections of change talk	11.50	9.91	42	0.75	.86
Reflections of sustain talk	3.90	5.82	39	0.25	.61
<b>Client</b>					
Change Talk	24.05	19.88	120	0.78	.93
Sustain Talk	7.72	8.84	49	0.22	.90
Percent Change Talk	0.78	0.18	0.80	-	-

*Note.* SD = Standard Deviation; ICC = Intraclass correlation coefficient.

<sup>a</sup>Proportion refers to reflections of change talk and reflections of sustain talk of total valenced reflections; proportion of change talk and sustain talk of total client language

**Table 3.**

Correlation matrix of provider and client verbal behaviors with provider global measurements

	1	2	3	4	5	6	7.
1. Empathy							
2. Acceptance	.56**						
3. Collaboration	.49**	.52**					
4. Autonomy Support	.51**	.39**	.40**				
5. Percent Change Talk	.10	.11	.22*	.02			
6. Reflections of Change Talk	.29**	.19*	.33**	.19*	.22*		
7. Reflections of Sustain Talk	.15	.08	.11	.12	-.28**	.28**	
8. Percent Reflections of Change Talk	.10	.14	.32**	.09	.32**	.69**	-0.1

\*  
 $p < .05$ .\*\*  
 $p < .01$ .