



Mechanisms of Motivational Interviewing: a Conceptual Framework to Guide Practice and Research

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Abstract

Reviews of the motivational interviewing (MI) training literature demonstrate MI is a nuanced skill set that takes carefully planned didactic training, application of skills in context-specific practice settings, and ongoing support to promote reflective practice and sustained proficiency. Despite the robust knowledge base related to training and how MI works to achieve favorable outcomes, these two literature bases are not well integrated. In an effort to inform and guide future research, we propose the mechanisms of motivational interviewing (MMI) conceptual framework, which expands upon previous work. Specifically, the framework adds training as an ongoing process consistent with Bennett-Levy's (Behav Cogn Psychother 34:57–78, 2006) model of skill development and acquisition to the existing two-path framework that helps us to understand how MI works to achieve its desired effects (Magill et al., J Consult Clin Psychol 82:973–983, 2014). Herein, we describe measures used to evaluate the mechanisms within the four MMI framework links: initial training to competency, competency to proficiency, proficiency to talk about change, and talk about change to behavior change. Next, we synthesize the literature associated with each of the mechanisms of the MMI. We conclude by discussing implications for practice and research. This framework offers a more complete path structure to understand the mechanisms of change associated with MI that could improve our understanding of inconsistent effect sizes observed across prior trials evaluating MI effectiveness.

Keywords Motivational interviewing · Motivation · Mechanisms of change · Conceptual framework · Intervention

Motivational interviewing (MI) is defined as “a collaborative conversational style for strengthening a person’s own motivation and commitment to change” (Miller and Rollnick 2012, p.

12). Increasingly, MI is becoming an important strategy for the field of prevention science, as it is embraced by multiple disciplines and its applications span the continuum of services

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(i.e., universal, selective, and indicated) to promote wellness (National Research Council and Institute of Medicine 2009). MI has been used by practitioners and researchers in several fields (e.g., child welfare, education, health, behavioral health, mental health, social work) to address a variety of topics common in the prevention science literature. These include preventing alcohol and illicit drug use, sexually transmitted infections, unplanned pregnancy, HIV, diet, heart disease, exercise, oral health, depression, ineffective parenting practices, ineffective teacher practices, school dropout, academic failure, challenging behavior, and obesity (Miller and Rollnick 2012; Pirlottet et al. 2012; Sanci et al. 2015). Also, consistent with a prevention science perspective, MI has been used as a supplement to existing evidence-based strategies to improve recruitment and retention in treatment (Miller and Rollnick 2012) and to enhance implementation fidelity of evidence-based practices (Reinke et al. 2014). Although various approaches and applications of MI have evolved over the past two decades, two consistent assumptions have not changed: (1) the possibility for change lies within the client (adolescents and older), and (2) the practitioner should facilitate conversations in which the person seeking help articulates the advantages of change.

The impact of MI has demonstrated efficacy when used alone and in combination with other interventions (Amrhein et al. 2003; Miller and Rollnick 2012; Magill et al. 2014, 2018). In addition to generating impressive outcomes as a stand-alone intervention for adults, youth, and families, MI is also proving to be a promising approach for improving the fidelity of implementation of evidence-based practices. As such, the broad application of MI to preventive interventions and implementation addresses important challenges in the field and appears to be helpful in the successful deployment of effective interventions across multiple applied and clinical settings (Fixsen et al. 2005; Herman et al. 2010).

Although the outcomes associated with MI are impressive overall, inconsistent effect sizes (i.e., variability) in trials evaluating MI effectiveness (Miller and Moyers 2015) have prompted efforts to develop a more nuanced understanding of how MI produces behavior change (i.e., its mechanism of change). For example, Magill et al. (2018), referencing several experts in the field, state “our understanding of exactly how MI works remains elusive, and this is particularly concerning given the pervasive dissemination of MI into community-based settings” (p. 141). To address these gaps in the extant research, the current paper seeks to build on prior reviews and conceptual frameworks (e.g., Magill et al. 2014; Miller and Rose 2009) to propose an expanded framework for understanding the mechanisms of MI, referred to as the mechanisms of motivational interviewing (MMI) conceptual framework. Toward that end, we describe measures used to assess

mechanism of the framework and provide a summary of empirical literature in support of the proposed framework. We conclude with recommendations for future research and practice. The proposed framework is instructive for guiding future research and training related to MI and its application in a variety of prevention and implementation arenas.

Mechanisms of Motivational Interviewing Conceptual Framework

The MMI builds on two seminal publications articulating how MI works. In a theoretical paper describing how MI works, Miller and Rose (2009) identified both a relational and a technical component as active ingredients, or mechanisms of change, of MI. Additionally, Magill et al. (2014) advanced this framework by identifying two distinct theoretical paths. One path (path a) predicts that the practitioner’s fidelity predicts client (hereafter referred to as participant) talk about change. The second path (path b) refers to the participants’ favorable talk about change predicting behavior change. The paths for Magill et al.’s framework are depicted in Fig. 1. Below each of the theoretical pathways are the mechanisms believed to account for change. Specifically, the mechanisms for fidelity in practice consist of a technical component, a relational component, and MI-inconsistent practices. The mechanisms for change talk include change talk, sustain talk, and proportion of change and sustain talk. We describe each of these in greater detail below.

Our expansion of the frameworks by Miller and Rose (2009) and Magill et al. (2014) involves the addition of a path (referred to in Fig. 1 as a link) between initial training and fidelity in simulation (henceforth referred to as competency) and a link between competency and fidelity in practice (henceforth referred to as proficiency)—which is where the Magill et al.’s two-path framework begins (see Fig. 1). As illustrated in Fig. 1, link 1 represents the association between MI skills training and competency. Link 2 emphasizes the association between competency and proficiency. The technical component, the relational component, and MI-inconsistent behavior represent distinct mechanisms in the initial training to competency (link 1) and competency to proficiency (link 2) links. In this article, we define fidelity as the degree to which providers deliver an EBT according to its standards and critical ingredients (similar to the construct of implementation quality in other fields; Bond and Drake 2019). We further differentiate fidelity uniquely in two contexts. When assessed in simulated contexts, we refer to this as fidelity in simulation (competency); when assessed in practice conditions with participants, we refer to this as fidelity in practice (proficiency). We believe this aligns with Bennett-Levy’s (2006) model of skill development and acquisition. Namely, Bennett-Levy introduced three inter-related systems: declarative, procedural,

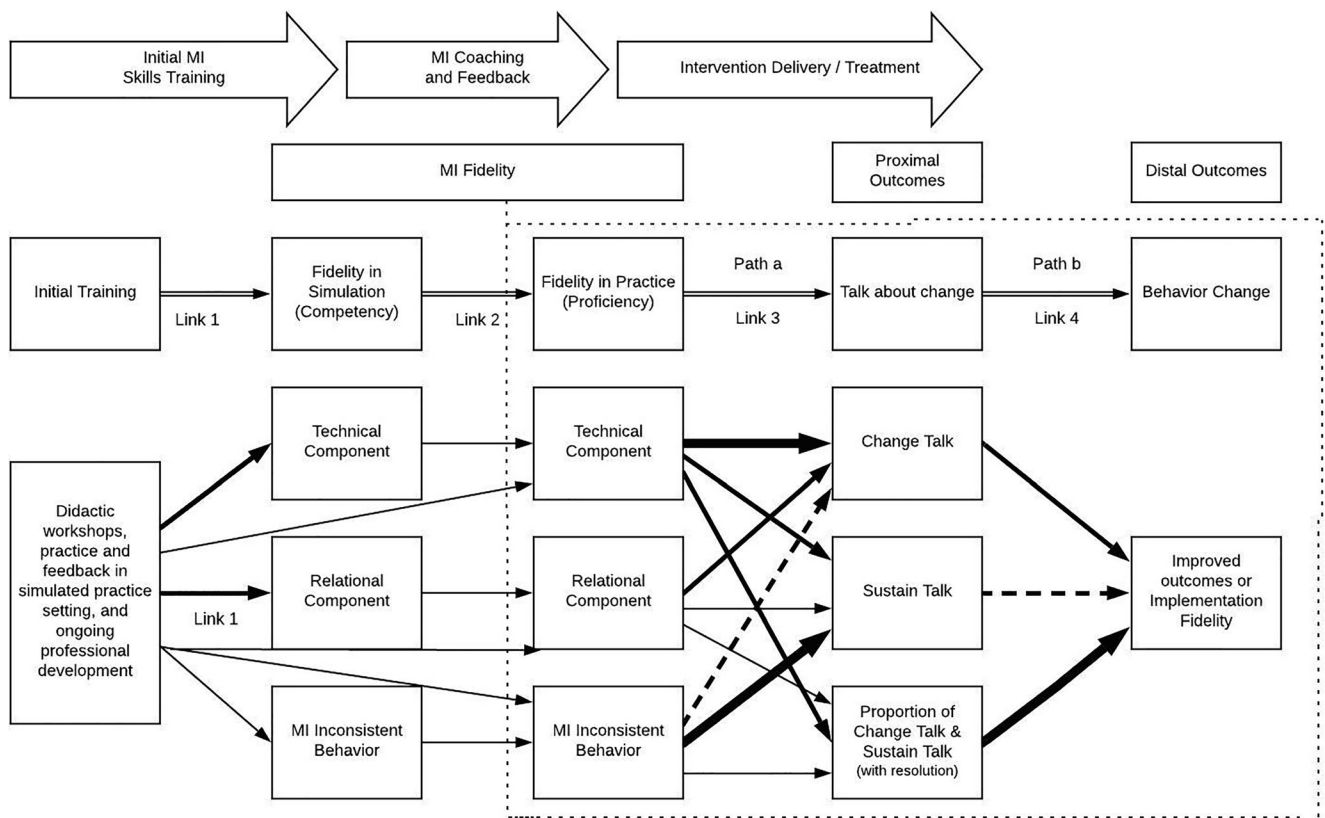


Fig. 1 Mechanisms of motivational interviewing conceptual framework. Dotted line represents Magill et al. (2014) two-path model. Double line, theoretical relationship; solid thin line, little, inconsistent, or no empirical

support for the relationship; solid medium line, modest empirical support for the relationship; solid heavy line, substantial empirical support for the relationship; dashed line, negative relationship

and reflective. The declarative system is concerned with knowing factual information. This knowledge can be gained through didactic training methods such as lectures, observational learning, or assigned readings. Bennett-Levy also suggests the knowledge learned through these approaches often fails to translate into procedural skills, which involves the application of skills in practice settings, unless supplemented with non-didactic approaches (role-plays, practice in applied settings, and supervision). Finally, reflection is the system that leads to true mastery. That is, through ongoing reflection, practitioners learn “to discern in what context, under what conditions, and with what people, particular strategies may be useful” (p. 60).

We include the constructs of competence and proficiency to maintain alignment with previous models in the MI literature (Hartzler et al. 2010; Moyers et al. 2014). Namely, Hartzler et al. (2010) suggested the development of MI competency is a multi-stage process whereby relational and technical skill development occurs in contrived settings with practice and feedback, whereas proficiency, which is defined by the application of these skills within authentic intervention settings, is developed in later stages. It is also important to note that Moyers et al. use competency and proficiency differently within the context of MI fidelity. Specifically, for

these authors, the terms denote different levels of MI fidelity, with competency being the lower level (i.e., fair) and proficiency being the higher level (i.e., good).

Three mechanisms are consistently used to define MI quality: the technical component, the relational component, and MI-inconsistent behavior. The technical component of MI involves the practitioner’s ability to analyze the participant’s language regarding a specific behavior change target and then to shape it with conversation that evokes change talk of greater depth, strength, and frequency during the interview; while acknowledging but not reinforcing language that supports the status quo (Miller and Moyers 2017; Miller and Rollnick 2012). Strategies that define the technical component of MI involve the intentional and strategic use of micro skills represented by the acronym OARS (i.e., open-ended questions, affirmations, reflections, and summaries) to strengthen the participant’s motivation for change (Miller and Moyers 2017).

If the technical component can be described as the “what” we do when we use MI, the relational component can be described best as the posture or spirit we embody as we do it. The relational component is comprised of accurate empathy, respect for participant autonomy, and egalitarian collaboration. Miller and Rollnick (2012) highlighted that intentional attempts to guide a participant toward the resolution

of their ambivalence is what distinguishes MI from client-centered approaches. Rooting the change process to the goals and values of the participant are at the heart of the relational component, which is a critical aspect of MI fidelity. MI-inconsistent behavior includes confrontation (e.g., lecturing, shaming, coaxing, arguing) and persuasion (e.g., being overly directive with the client or offering unsolicited advice or advice without permission).

Link 3, which is identical to Magill et al.'s (2014) path a, depicts how proficiency, the application of both the technical and relational components of MI, as well as the effect of MI-inconsistent behaviors (Amrhein et al. 2003), within applied intervention delivery/treatment, impacts participant talk about change. Talk about change consists of three mechanisms: change talk, sustain talk and proportion of change and sustain talk. Change talk can be described as verbalizing the positive aspects about change or the negative aspects of the status quo. Change talk statements are commonly identified via expressed desires (I want to...), abilities (I can do...), reasons for changes (I should because...), needs (I need to...), or commitments (I will, I did...). Conversely, sustain talk can be categorized as verbalizing positive aspects of the status quo or negative aspects about change. Finally, link 4, which is identical to Magill and colleagues' path b, illustrates how participants' talk about change impacts their actualized behavior change.

In the following section, we describe tools that can be used to assess each mechanism, followed by a summary of the empirical evidence associated with each link.

Tools to Evaluate the Mechanisms

A variety of instruments have been used to capture the mechanisms within the MMI framework. The measures that can be used to evaluate each of the mechanisms leading to improved behavior outcomes or improved fidelity follow.

Technical Component There are several measures that can be used to measure the technical component. For example, the Helpful Response Questionnaire (HRQ; Miller et al. 1991) is a brief (i.e., 15–20 min), free-response measure developed for administration in group settings such as MI trainings and workshops to measure accurate empathy, the ability to sensitively and accurately infer someone's thoughts, feelings, and struggles (Rogers 1951). The HRQ consists of six hypothetical client statements relevant to substance abuse counseling; thus, the HRQ measures only one dimension of the technical component, and only measures competency since it represents a hypothetical situation. To assess the ability to generate empathic responses, respondents are asked to write down how they would respond verbally to each *simulated* communication (e.g., "Write here what you would say next."). Raters

code each open-ended response on a 5-point scale ranging from 1 for responses that contain no reflection and include a roadblock (Gordon 2008) to 5 for responses that include paraphrasing or inferred meaning and inferred emotion appropriate to the written statement. Cronbach's alpha, a measure of the internal consistency of the measure, ranged from .92 for pre-training administration to .89 for post-training administration. Item-level reliability coefficients ranged from .71 to .91 and inter-rater reliability for the HRQ total score was .93 (Miller et al. 1991). The HRQ is context specific for substance abuse counseling; however, it has not been updated to align with the most current (third edition) conceptualization of MI (Miller and Rollnick 2012). It also measures a fairly narrow aspect of technical MI skills (i.e., reflections).

Another measure of the technical component is the Video Assessment of Simulated Encounters (VASE-Revised), which assesses five MI skills: reflective listening, response to resistance, summarizing, eliciting change talk, and developing discrepancy (Rosengren et al. 2008). The VASE-R consists of three video vignettes in which actors portray substance abusers. Each vignette includes a number of statements by a hypothetical (i.e., *simulated*) client. After each statement, the instrument administrator pauses the recording and prompts respondents to write a response that is consistent with a specific MI principle. In total, there are 18 items ($n = 6$ items vignette; for each of the 3 vignettes). For each vignette, there are five open-ended response items and one multiple-choice item, for which the respondent must also provide a written rationale for the choice made. Raters code each item on a 3-point scale. Items are scored 0 if the written statement is confrontational or engenders resistance, 1 if it is neutral or inaccurately represents the content of the hypothetical client's statement, or 2 if the statement reflects appropriate use of the specific MI skill being assessed. Rosengren et al. reported a Cronbach's alpha of .85 for the VASE-R total score with internal consistency for the subscales ranging from .44 for developing discrepancy to .73 for summaries. Item-level inter-rater reliability coefficients by subscale were in the acceptable range across two reported studies with intra-class correlations ranging from .41 to .96. As evidence of concurrent validity, Rosengren et al. (2008) reported that the HRQ total score was correlated with VASE-R total scores ($r = .50$) and subscale scores with correlations ranging from .23 for the developing discrepancy subscale to .45 for the reflective listening subscale. The VASE-R measures several dimensions of the technical component. However, like the HRQ, it only measures competency since it represents a hypothetical situation, is limited to those practicing in substance abuse counseling contexts, and has not been updated to align with the third (most current) conceptualization of MI (Miller and Rollnick 2012).

Adaptations of the HRQ and VASE-R were created for assessing the technical component in the context of school-

based interventions, and also updated to reflect the most recent conceptualization of MI (Miller and Rollnick 2012). The Written Assessment of Simulated Encounters-School Based Applications (WASE-SBA; Lee et al. 2013b) measures a person's ability to generate reflective responses and is scored by rating each response on 5-point scale, with a rating of 1 being indicative of weak reflective practice containing MI-inconsistent behavior, 3 is indicative of simple reflective practice, and 5 is indicative of complex reflective practice that infers potential parent, teacher, or adolescent behavior change. The scores for each of the six responses can be combined to reflect the overall level or degree of reflective practice across the measure.

The Video Assessment of Simulated Encounters-School Based Applications (VASE-SBA; Lee et al. 2013a) assesses MI competency, utilizing three video recorded vignettes with eight opportunities to respond in each vignette (24 items total). Respondents are prompted to generate written responses consistent with MI skills. The measure contains four subscales: open-ended questions, affirmations, reflections, and summaries. All responses are rated on a 3-point scale with 1 corresponding to responses that “Elicit/Reinforce Sustain Talk or Engender Discord,” 2 reflecting responses that were “neutral”, and 3 reflecting responses that “Elicit/Reinforce Change Talk.” Subscale scores are derived for each skill, as is a total score from the sum of the subscale scores. The WASE and VASE-SBA can be accessed at <http://louisville.edu/kent/research-special-programs-projects/current-projects/rumis>, and have evidence of reliability (internal consistency estimates ranged from .71 to .76 for the WASE and from .77 to .81 for the VASE-SBA) based on preliminary analyses (Small et al. 2014).

The well-known motivational interviewing treatment integrity (MITI) can also be used to evaluate the technical component. The MITI code enables examination of MI fidelity through coding of four global scores and 10 behavior counts (Moyers et al. 2015). A trained coder uses the MITI to review a random 20-min audio segment within a single pass, tallying counts for each of the ten behavior categories (e.g., simple reflections, complex reflections, affirmations, questions). After listening to the audio segment, the coder provides a global rating on a 5-point scale for each of four global dimensions. The two global dimensions that measure technical competency are cultivating change talk and softening sustain talk. Several behavior counts are recorded as indicators of technical competency, including open-ended questions, close ended questions, simple reflections, complex reflections, MI adherent statements, affirmations, and summaries. The two global dimensions, cultivating change talk and softening sustain talk, are combined to produce a technical global summary score, and several behavior counts are combined to generate two summary scores that are indicators of

technical competency: (a) percent complex reflections and (b) the ratio of reflections to questions. The percent of complex reflections is calculated by summing tallies of simple (SR) and complex reflections (CR) and dividing the number of complex reflections by the total. Finally, as the name implies, the ratio of reflections to questions is the ratio of total reflections (e.g., SR + CR) to the number of questions posed during a session. For each score, there are thresholds based on expert opinion for basic and advanced fidelity.¹ Thresholds for technical skills are scores greater than or equal to 4 (e.g., basic) and 5 (e.g., advanced). Complex reflections above 40% indicate basic fidelity and above 50% indicate advanced fidelity. Finally, a 1:1 ratio of reflections to questions is the threshold for basic fidelity, and a ratio of 2:1 or higher is the threshold for advanced fidelity. According to Moyers et al. (2016), inter-rater reliability based on inter-class correlations (ICC) ranged from .77 to .86 for global ratings; from .58 to .88 for behavior counts; and from .53 to .92 for MITI summary measures.

The Motivational Interviewing Skills Code (MISC; Houck Moyers et al. 2011) was originally developed as a means to evaluate the quality of MI from audio and video recorded encounters for both practitioner feedback (i.e., training and coaching) and research purposes. The MISC 2.5 follows the development of the MISC 2.1 (Miller et al. 2008) and has incorporated the Motivational Interviewing Sequential Code for Observing Process Exchanges (MI-SCOPE; Martin et al. 2005) into a comprehensive coding tool. The MISC 2.1 and the MI-SCOPE both require the coder to “pass” through the recording twice, once for the global rating scales, and a second time for the behavior classifications. The MISC 2.5 has adopted a three “pass” procedure during which the coder utilizes the first pass to score the global rating scales; a second pass to parse the participant and practitioner utterances into codable units; and a third pass to assign behavior classification to participant and practitioner utterances. The global rating scores, which can be used to evaluate competency, are derived from a 5-point Likert scale assigned by the coder to characterize the entire interview. Two practitioner dimensions of the MISC serve as indicators of technical competency. Finally, there are 17 basic categories of practitioner behavior in MISC 2.5, all of which measure indicators of the technical component: affirm, confront, direct, emphasize control, facilitate, filler, giving information, open question, closed question, raise concern with permission or without permission, simple reflection, complex reflection requires, reframe, support, structure, and warn. Included in the practitioner

¹ The MITI manual refers to cutoff scores rather than thresholds and labels the minimum cutoff basic competency (“fair”) and the advanced cutoff proficiency (good). We have changed the nomenclature in this manuscript to improve readability.

summary scores are the following indicators of the technical component: ratio of reflections to questions, percentage open questions, percentage complex reflections, MI-consistent responses, and sequential MI-consistent responses.

While the HRQ and the VASE-R are psychometrically sound tools predominantly used to evaluate the technical component, they have not been updated to align with the most recent conceptualization of MI (Miller and Rollnick 2012). The WASE-SBA and VASE-SBA both were developed specifically to measure the technical component with MI skills in alignment with the most recent conceptualization of MI (Miller and Rollnick 2012) and have demonstrated sensitivity to discrete changes in practitioner skill across several small training studies. However, these two tools have not yet been subjected to psychometric scrutiny. By far, the most sensitive, flexible, and reliable instruments for the evaluation of the technical component are the MITI and MISC. However, both are labor intensive and require highly trained coders.

Relational Component Many of the measures described above also have indicators of the relational component. Specifically, two of the four global dimensions of the MITI (Moyers et al. 2015) measure relational competency: partnership and empathy. These scores are combined to form a relational global summary score. For relational skills, scores greater than or equal to 3.5 indicate basic fidelity and scores greater than or equal to 4 indicate advanced fidelity. Additionally, four of the six practitioner dimensions of the MISC (Houck et al. 2011) are indicators of relational competency: acceptance, empathy, autonomy support, and collaboration.

MI-Inconsistent Behavior A couple of the previously described measures have indicators of MI-inconsistent behavior. Specifically, one of the behavior counts for the MITI (Moyers et al. 2015) is MI-inconsistent behavior and two practitioner summary scores from the MISC can be used as indicators of MI-inconsistent behavior: sequential MI-consistent responses and MI-inconsistent responses.

Change Talk, Sustain Talk, and Proportion of Change to Sustain Talk The MISC 2.5 can be used to assess participant talk about change (Miller et al. 2008; Martin et al. 2005). Participant behavior codes require that the coder understand what target behavior change has identified within the recording, so that the client's language can be categorized into one of three categories follow/neutral/ask, change talk, and sustain talk. The MISC 2.5 provides a number of summary scores related to client language; these include change talk, sustain talk, and percentage client change talk. There has been less consideration of measurement and development of tools to document this link. The MISC is the only measure that we were able to identify which assesses talk about change. Clearly, additional measures are needed to accurately measure talk about change talk.

Empirical Evidence for the MMI Framework

In this section, we summarize the empirical literature that provides support for each of the MMI mechanisms. In Fig. 1, we have included a variety of arrow types to represent the direction and relative strength of the relationships, based on the level of empirical support from our review.

Link 1: Interventionist Training and Competency Our review of the training literature evinced three systematic reviews and two meta-analyses related to the relationship between initial training and MI competency. In one review, Söderlund et al. (2011) identified nine quasi-experimental MI training studies, of which six reported improvements in technical and relational skills in favor of the experimental training condition. For the 12 studies that employed an experimental design, 10 reported positive changes in technical and relational skills for those who received the training. Additionally, Barwick et al. (2012) reviewed 22 training studies and noted that 17 had positive impacts on MI competency, although they did not specify which aspects of competency (i.e., technical component, relational component, or MI-inconsistent behavior). Further, de Roten et al. (2013) conducted a meta-analysis of 15 MI studies and reported that the majority of those studies reported training was effective for improving the technical and relational MI competency components. Variations of these training studies have been replicated several times with similar results (Dunn et al. 2015; Schwalbe et al. 2014). Figure 1 depicts our assessment of link 1 based on these reviews, which were all completed in the area of substance use and health. Specifically, solid medium lines between initial training and technical skills, as well as initial training and relational skills indicate there is modest empirical support demonstrating a relationship between initial training and these components of MI competency. Further, the solid thin line in Fig. 1 between training and MI-inconsistent behavior indicates there is little, inconsistent, or no evidence in support of this mechanism.

Interventionist Training and Proficiency Since some studies focused on whether initial skills training leads to proficiency without evaluating competency (i.e., a direct path from training to proficiency), we review this literature in this section. Our review of the training literature that bypasses the measurement of fidelity in simulated setting (i.e., competency) yet measures fidelity in authentic practice settings (i.e., proficiency) suggests (a) proficiency following training is highly susceptible to fading without continued support focused on reflection (i.e., coaching or supervision) and (b) it is not uncommon for there to be within-participant variability in MI proficiency across time. Specifically, Schwalbe et al. (2014) conducted a meta-analysis of training studies that compared standard training to self-training conditions with assessments to

evaluate MI proficiency at post-training, + 3 weeks, and + 6 weeks. Twenty-one studies met the inclusion criteria. The effect sizes were large at post-training, began to erode at 3-month follow-up, and recovered somewhat at 6-month follow-up. This review did not specify what aspects of MI were implemented with proficiency (i.e., technical component, relational component, MI-inconsistent behavior). In Fig. 1, these relationships are represented with solid medium lines.

Studies that examine the direct link between initial training and MI proficiency are difficult to interpret for a couple of reasons. First, without fully understanding how practitioners do under ideal or simulated conditions (competency), it is difficult to fully understand if lack of initial skill development (competency) is the result of never learning to apply the skills or being unable to generalize the skills to practice settings. Second, in these studies, there are not consistent distinctions between proficient use of MI with respect to technical and relational components or MI-inconsistent practices. Thus, our ability to fully understand the mechanisms within the MMI model is the result of insufficient measurement tools.

Link 2: Competency and Proficiency The second link in the MMI framework addresses whether competency is associated with proficiency. Because we were unable to identify any studies directly examining this relationship, Fig. 1 contains a solid thin line between each fidelity component (technical, relational, and MI-inconsistent behavior) in simulated settings (competency) and the corresponding component in authentic practice settings (proficiency). Thus, while it is reasonable to assume these variables would be correlated, it is plausible that some individuals would be able to apply MI skills in simulated but not authentic practice settings; yet this assumption has not been validated empirically.

Link 3: Proficiency and Client Talk About Change The third link, which initiates the two-path framework that the MMI conceptual framework expands, theorizes that proficiency influences client talk about change. Recent meta-analyses and multivariate analyses summarize the research to date regarding link 3 (Magill et al. 2014, 2018; Pace et al. 2017; Romano and Peters 2016). These studies highlight the fact that proficiency is associated with talk about change, and two additional studies provide evidence the relationship is causal (Glynn and Moyers 2010; Moyers et al. 2017). Further, existing literature demonstrates MI-inconsistent practices are detrimental to achieving desired outcomes, yet specifics regarding this mechanism are not well understood. Finally, the relational component is also not well understood, with some studies suggesting providers' relational skills predict client talk about change and other studies failing to validate this association empirically.

Magill et al. (2014, 2018), Romano and Peters (2016), and Pace et al. (2017) all found that technical MI skills were

consistently related to more change talk. Yet surprisingly, technical MI skills were also related to more sustain talk, suggesting technical MI skill leads to the exploration of ambivalence and may increase the openness of both change talk and sustain talk in regard to ambivalence. Based on these reviews, we have included a solid heavy line between the technical component of MI proficiency and change talk, indicating the evidence for this relationship is substantial. Further, we have included solid medium lines from the technical component to both sustain talk and proportion of change talk and sustain talk (see Fig. 1).

Evidence supporting the relational components—comprised of accurate empathy, respect for client autonomy, and egalitarian collaboration—impact on client talk about change has been inconsistent, with several meta-analyses producing mixed results (Magill et al. 2014, 2018; Miller and Rose 2009; Romano and Peters 2016). Romano and Peters detailed a number of considerations to current coding systems that may limit our ability to validate this theoretical relationship. Based on these reviews, we have included in Fig. 1 a solid thin line between the relational component and sustain talk and the relational component and proportion of change talk and sustain talk, which indicates the empirical support for this relationship is inconsistent. In contrast, the relationship between the relational component and proportion of change talk and sustain talk does not appear to have been examined, as evidenced by solid thin line in Fig. 1.

Despite mixed effects with regard to change talk, the relational component appears to have some desirable effects. Boardman et al. (2006) found positive associations between ratings of practitioner collaboration, egalitarianism, and empathy and client engagement and alliance, while ratings of confrontation were negatively associated with the same. Dunn et al. (2006) also found through qualitative data analysis that clients consistently viewed practitioner empathy and use of active listening as the most favorable aspects of their session.

Although the impact of MI-inconsistent practice is not well understood, it is becoming increasingly clear that avoiding it may be equally as important, if not more important, than demonstrating strong technical MI skills. Specifically, two studies have found that MI-inconsistent behavior is predictive of increased sustain talk (Apodaca and Longabaugh 2009; Romano and Peters 2015; see solid heavy line in Fig. 1).

Evidence of Causality While the studies in these meta-analyses demonstrated an association between proficiency and talk about change, two studies experimentally manipulated providers' attempts to influence client language, thus establishing a causal relationship that bears directly upon one of the main theories regarding the way MI achieves its effect (Glynn and Moyers 2010; Moyers et al. 2017). Both studies do this by isolating and manipulating change talk. Glynn and Moyers

employ a single baseline (ABAB) design where nine interventionists alternate between elements of two empirically supported treatments for alcohol use disorders: change talk (from MI) and functional analysis (from cognitive-behavior therapy). Moyers et al. randomly assigned 190 treatment providers to a standard MI training or an MI training emphasizing an influence on client language and examined their interactions with participants receiving substance use counseling. These studies demonstrate the relationship between provider use of MI and talk about change is causally related, rather than simply empirically associated.

In summary, there is a robust literature base for link 3, which supports the association between proficient use of MI and participant talk about change. Two additional studies that experimentally manipulated proficiency also provide preliminary support for a causal relationship between proficiency and change talk. Further, the literature base demonstrates that MI-inconsistent practices and the relational component are important, but not yet well understood.

Link 4: Client Talk About Change and Outcomes The fourth link in Fig. 1 depicts the relationship between client talk about change and behavior change. Again, Magill et al.'s (2014, 2018) meta-analyses, Pace et al.'s (2017) multivariate analysis, and Romano and Peters' (2016) literature review summarize well the literature documenting an association between client talk about change and behavior change, which constitutes the second path of the two-path model the MMI framework expands. As can be seen in Fig. 1, the solid medium line between change talk and outcomes/implementation fidelity suggests there are inconsistent findings regarding the association between these variables. Further, the dashed line between sustain talk and improved outcomes or implementation fidelity indicates there is modest empirical support demonstrating increased sustain talk leads to worse outcomes. Finally, the solid heavy line between proportion of change talk to sustain talk and improved outcomes or implementation fidelity indicates there is substantial empirical evidence suggesting when sustain talk and change talk are combined into a composite score it is the most predictive of improved outcomes or implementation fidelity. This is particularly beneficial when these conversations are in line with a participant's preexisting values and internal motivators. Taken together, it seems that minimizing sustain talk is at least as valuable, if not more valuable, than increasing change talk for influencing behavior change.

Discussion

As practitioners and prevention science researchers adopt MI in their work it is imperative that they understand the relative contributions provided by the mechanisms of change leading

to improved outcomes or implementation fidelity (leading to improved intervention fidelity). It is our hope that the expanded framework presented in this manuscript, the MMI framework, provides a road map for prevention researchers and practitioners to conceptualize training and implementation fidelity as an ongoing process. Specifically, and as elaborated below, the MMI framework is a useful resource for MI trainers, both with regard to optimizing training processes (i.e., didactic workshops, individualized feedback, and ongoing support) and content. Additionally, the MMI framework can be used to guide researchers, helping them conceptualize their work within the MMI framework links and identify appropriate measures to do so. Understanding the mechanisms of change associated with MI, beginning with training, could improve outcomes as well as our understanding of uneven effect sizes in clinical trials evaluating MI effectiveness (Miller and Moyers 2015).

Implications for Practice

The evidence for link 1 of the MMI framework, as well as evidence supporting the direct link from training to proficiency (link 2), make clear that MI skill—whether competency or proficiency—does not occur by happenstance. At a minimum, implementing MI with fidelity (i.e., intervention fidelity) requires participants participate in didactic workshops, individualized feedback, and ongoing support to promote reflection (i.e., coaching and supervision; Dunn et al. 2015).

The evidence base related to links 3 and 4 has implications for what content should be included in training curriculum to maximize the likelihood of improved outcomes or implementation fidelity. Specifically, it is clear that learning opportunities must include not only skills related to both the relational and the technical components of MI, but also strategies to help practitioners avoid MI-inconsistent practices. With regard to the technical component, it is particularly clear practitioners need to be trained to recognize and attend to change talk and sustain talk. Specifically, and as noted by Moyers et al. (2016), when sustain talk is frequent and strong early in a relationship, practitioners should focus on diminishing it prior to focusing on promoting change talk. Additionally, it is critical for practitioners to understand, and reduce, MI-inconsistent practices (Apodaca and Longabaugh 2009; Romano and Peters 2015). Although we are not aware of any studies that have empirically evaluated strategies for teaching practitioners to avoid using MI-inconsistent practices, we recommend MI-inconsistent practices be defined and addressed when they are observed in workshop settings and simulated practice routines. Additionally, if using audio or video to support training, we recommend trainees be provided the opportunity to identify and discuss MI-inconsistent practices.

There is substantial evidence exists for the technical component of MI. In turn, it is critical not to promote practices that

only address the relational component, which is not unique to MI, as an MI adaptation. For example, approaches that encourage a conversational atmosphere that is non-hierarchical, supportive, and non-directive (avoiding the expert stance), but do not address the technical aspect of MI, would be mischaracterized as MI adaptations since the strategic use of the core MI skills (OARS; open-ended questions, affirmations, reflections, summaries) and processes (engage, focus, evoke, plan) to influence talk about change are essential to MI. Further, rather than focusing on increasing change talk alone, practitioners need to understand decreasing sustain talk may also be necessary in some situations, and that the resolution of ambivalence (proportion of change talk to sustain talk) is critical—not simply within a session but likely over the course of a helping relationship.

Finally, improving our ability to effectively train practitioners to use MI is important when it is used as a stand-alone intervention to address topics common in the prevention science literature. Effective training is equally important when MI is used as a supplement to existing evidence-based strategies to improve recruitment and retention in treatment (Miller and Rollnick 2012) or to improve implementation fidelity of evidence-based practices (Reinke et al. 2014).

Implications for Research

The constructs in the framework, as well as the tools that can be used to measure them, can serve as a road map for researchers. There are several research implications related to the description of the MMI framework, as well as the tools used to measure the associated mechanisms and the quality of the evidence supporting the mechanisms. First, additional and improved measurement tools are needed to assess the mechanisms (technical component, relational component, and MI-inconsistent practices) that comprise links 1 and 2. As noted previously, the existing measures are either resource intensive (MITI and MISC), do not reflect current conceptualizations of MI practice (HRQ and VASE-R), or are limited to practice in school-based contexts (WASE-SBA and VASE-SBA). Multiple fields (e.g., child welfare, education, health, behavioral health, mental health, social work) would benefit from the creation of less intensive, reliable, and valid measures to evaluate indicators of the technical component, the relational component, and MI-inconsistent practices in simulated settings (i.e., competency). Second, more research is needed within and across all four links. We maintain one reason for the lack of empirical research related to these links, particularly links 1 and 2, is because there has not been a conceptual model, or road map, to inform research that views training as an ongoing process related to fidelity in practice settings, talk about change, and improved outcomes or implementation fidelity. With regard to link 1, we need to better understand what methods are useful for minimizing participant's use of

MI-inconsistent practices. Further, we know little about link 2, or the relationship between competency and proficiency. Given the prevalence of trainings that include application of skills in practice settings and post-training reflection opportunities, it is surprising the concepts of competency (fidelity in simulated settings) and proficiency (fidelity in practice settings) have not been attended to more carefully in the literature. This relationship requires additional study. Although there is value in assessing MI proficiency immediately following training, it may be more useful to attend to Bennett-Levy's (2006) model of skill development and acquisition by assessing MI competency immediately post-training. Attending to this relationship will allow us to determine if failure to reach proficiency standards is the result of initial skill acquisition or generalization of skills to more complicated practice settings.

The evidence base is far more robust for links 3 and 4; however, there are several areas where replication, increased rigor of experimental design and methodology, and synthesizing within service delivery sectors would be useful. For example, we need additional studies that experimentally manipulate the providers' use of MI. Specifically, there is a need for sequential analyses to examine the associations between MI skills and client talk about change. It is also important to note that crude coding of MI skill and talk about change is vulnerable to misrepresentations of the technical component of MI as well as conclusions about MI's effectiveness. Thus, it is critical that measures of MI fidelity reliably differentiate between the relational component, technical component, and MI-inconsistent practices. Further, and in regard to the findings presented by Romano and Peters (2016), it may be helpful in future research to examine the possibility that the relational component of MI functions as a mediator or moderator for the technical component of MI, rather than as a distinct input to the change process. In this way, increases in relational skills amplify the influence when technical skills are applied. It seems logical to assume that engagement, particularly during the early stages of MI interactions which often focus on values and goals, may support client change talk. Finally, the major developers of MI practice (Miller and Rollnick 2012) and existing frameworks (Magill and colleagues 2014, 2018; Romano and Peters 2016), including the MMI, assume talk about change is the only variable mediating the relationship between MI fidelity and improved outcomes or implementation fidelity. It is possible other critical mediators or moderators exist, and they should be examined. For example, it is possible that attitude, temperament, or values are important, yet not captured by coding participant speech. Further, it is possible that baseline levels of the behavior change sought, or participant characteristics, are critical moderators.

Next, future research should also be conducted to further examine the evidence supporting these theoretical

relationships within fields of practice to help us understand if the relationships vary depending on practice context. The majority of evidence available to support the links in the MMI framework was generated within the area of alcohol and illicit drug use. Increasingly, fields such as child welfare, health, mental health, and education are establishing their own evidence base specific to MI. It is possible the associations identified in the MMI framework are different for different contexts. We do not presume the weight of the evidence we have found in this review, which is largely from the use of MI to address alcohol and illicit drug use, will be identical across fields of study and social problems. Instead, we believe the type of services being delivered, as well as characteristics of the practitioners and beneficiaries of services are important. For example, it is feasible that practitioners from different fields, which can have diverse training and practice experience, respond differently to identical training procedures. Further, the associations in the MMI framework might differ based on participant characteristics such as age, cognition, and presenting problem.

It is also possible, if not likely, that variables that moderate or mediate the associations in the MMI framework, but are not part to this framework, vary by context. For example, in some settings, there may be a higher level of baseline motivation for targeted behavior change among participants than in other settings. Yet there is more work needed to determine the extent to which the strength of these associations are moderated by contextual factors (e.g., schools, clinics, medical settings), cultural interpersonal dynamics, or developmental factors (e.g., working with children and youth, relative to adults).

Finally, the clinical proficiency thresholds, which are derived from expert opinion, have served as a standard for the last decade but have not yet been empirically validated and require further investigation. As noted by Moyers et al. (2014), "...these (thresholds) are based on expert opinion, and currently lack normative or other validity data to support them. Until those data become available, these thresholds should be used in conjunction with other data to arrive at an assessment of clinician basic competency and proficiency using MI" (p. 33). Further, proficiency standards across instruments designed to measure MI fidelity appear to need careful scrutiny and empirical validation. Several studies have documented that even when training conditions are seemingly ideal (e.g., conducted by researchers and highly trained experts in controlled settings), many participants do not reach proficiency thresholds (Hall et al. 2016). Thus, it is important to examine the relationship between proficiency standards and proximal and distal outcomes and to adjust them based on empirical data, rather than clinical expertise alone.

Limitations

Despite the contribution the MMI framework adds to the literature, the framework is limited in a couple of respects. First, our review of the evidence was not systematic. Specifically, we did not conduct a meta-analysis across all of the mechanisms nor did we engage in a systematic review. Thus, while we feel confident that the strength of the evidence we have presented in the narrative, and represented in Fig. 1, is accurate, this review was not intended to represent a definitive statement on the magnitude of the evidence with regard to each mechanism. In fact, we hope this framework inspires others to conduct systematic reviews on the different links and mechanisms discussed herein. Second, the literature we reviewed is primarily from the field of substance use and to a lesser extent the health field. There is emerging evidence related to MI in many service sectors that have not been included in this review because the science in these fields is just developing.

Conclusion

In this article, we presented the MMI conceptual framework, which expands upon previous frameworks by conceptualizing training as an ongoing process consistent with Bennett-Levy's (2006) model of skill development and acquisition. It is critical that practitioners and researchers who adopt MI understand the mechanisms of change that lead to improved outcomes and fidelity, so that they can be appropriately emphasized in training content. Although our understanding of how MI works has increased markedly over the past 20 years, continuing to advance theoretical models explaining how MI works will lead to more useful measurement tools and studies, which will improve practice and potentially explain the variability that has been observed in even the most rigorous studies of MI effectiveness.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Statement of Human Rights This manuscript did not involve human participants.

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