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Psychometric Properties of the Motivational Interviewing Treatment Integrity Coding System 4.2 with Jail Inmates

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Abstract

Motivational Interviewing (MI) is an evidence-based approach shown to be helpful for a variety of behaviors across many populations. Treatment fidelity is an important tool for understanding how and with whom MI may be most helpful. The Motivational Interviewing Treatment Integrity coding system was recently updated to incorporate new developments in the research and theory of MI, including the relational and technical hypotheses of MI (MITI 4.2). To date, no studies have examined the MITI 4.2 with forensic populations. In this project, twenty-two brief MI interventions with jail inmates were evaluated to test the reliability of the MITI 4.2. Validity of the instrument was explored using regression models to examine the associations between global scores (Empathy, Partnership, Cultivating Change Talk and Softening Sustain Talk) and outcomes. Reliability of this coding system with these data was strong. We found that therapists had lower ratings of Empathy with participants who had more extensive criminal histories. Both Relational and Technical global scores were associated with criminal histories as well as post-intervention ratings of motivation to decrease drug use. Findings indicate that the MITI 4.2 was reliable for coding sessions with jail inmates. Additionally, results provided information related to the relational and technical hypotheses of MI. Future studies can use the MITI 4.2 to better understand the mechanisms behind how MI works with this high-risk group.

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Contributors

Dr. Owens designed the study, wrote the protocol, conducted study interviews and the treatment intervention, completed statistical analyses, and contributed to the writing of the manuscript. Ms. Rowell conducted study interviews and the treatment intervention, provided summaries of previous research studies, participated in coding of session data, performed statistical analyses, and contributed to the writing of the manuscript. Dr. Moyers provided oversight and supervision of the treatment intervention and coding of session data, and contributed to the writing of the manuscript. All authors participated in editing and have approved the final manuscript.

Conflicts of Interest

All authors declare that they have no conflicts of interest.

Keywords

Motivational Interviewing; Motivational Interviewing Treatment Integrity coding system; therapy process; jail inmates; substance use

1 Introduction

Motivational Interviewing (MI) is a brief, evidenced-based intervention aimed at increasing individuals' motivation towards behavior change (Burke, Harkowitz, & Menchola, 2003; Miller & Rollnick, 2012). MI is effective in reducing substance use across a range of settings: healthcare, public health settings, and corrections (Resnicow et al., 2002; Lundahl et al., 2013; McMurren, 2009; Riper, Andersson, Hunter, de Wit, Berking, & Cuijpers, 2013; Smedslund et al., 2011). In particular, MI has shown promise as an effective intervention with forensic populations (for both substance use and criminal recidivating) with a meta-analysis finding MI to be associated with increased treatment retention, increased motivation for change, and reduced offending (McMurren, 2009). Despite these encouraging findings, some studies have failed to find an effect of MI with forensic populations (Ferguson, 1997; Kennerley, 1999; Kistenmacher, 2000; Slavet et al., 2005). Several reasons for these mixed findings are possible, including unmeasured variance due to poor treatment delivery, which is the focus of the current study.

Treatment fidelity is the degree to which a therapeutic method was given as it was intended (McLeod, Southam-Gerow, & Weisz, 2009; Perepletchikova, Hilt, Chereji, & Kazdin, 2009). Measuring treatment fidelity is vital to understanding if and how treatments work. For example, research on mechanisms of a treatment is compromised if the treatment was not delivered as prescribed (Southam-Gerow & McLeod, 2013). For MI in particular, many treatment fidelity measures have been created and studied (Madson & Campbell, 2006). Of these measures, the Motivational Interviewing Treatment Integrity Code (MITI 4.2; Moyers, Martin, Manuel, Hendrickson, & Miller, 2005; Moyers, Rowell, Manuel, Ernst, & Houck, 2016) is most widely used, and has the advantage of including both behavior counts (a tally measure of specific therapist behaviors) and global scores (Likert-type scale measurements of overall impressions).

Recent theoretical advances of MI highlight two specific active components: a) the relational component, which is focused on the interpersonal relationship and spirit of MI; and b) the technical component, which focuses on intentional influence on the client's offered language during MI sessions (Miller & Rollnick, 2012; Miller & Rose, 2009). In particular, and uniquely in MI, the therapist attempts to encourage the client to speak in favor of change (change talk) and to reduce or soften the client's language in favor of the status quo (sustain talk).

The relational component of MI, as measured in ratings of Empathy and Partnership, has garnered some support in the treatment literature, with Empathy predicting better client engagement and outcomes (Gaume, Gmel, & Daeppen, 2008; Moyers, Miller, & Hendrickson, 2005). Recent evidence also suggests that the language that clients offer and therapists' reflections of their language are valuable indicators of MI success (Magill et al.,

2014). The technical hypothesis of MI states that client language (change and sustain talk) mediates the relationship between MI and outcomes via two pathways: a) therapist reflections of change talk increase client change language, which is then associated with better client outcomes; and b) therapist reflections of sustain talk increases client sustain language, which is conversely associated with worse outcomes (Magill et al., 2014). Evidence for the change talk pathway is mixed. There is convincing support that when therapists exhibit good MI skills client change talk will increase; however, there is a lack of evidence that subsequent change talk is predictive of improved client outcome (Magill, et al., 2014). On the other hand, evidence for the sustain talk pathway is stronger. It is clear that when therapists use poor MI skills, client sustain talk is more frequent and, further, this sustain talk predicts worse outcomes (Magill, 2014). To better understand these proposed mechanisms of MI, the MITI 4.2 was updated to include two new global measures of these technical components: Cultivating Change Talk (CultivateCT) and Softening Sustain Talk (SoftenST; Moyers et al., 2016).

The MITI 4.2 global measures of Relational (Empathy, Partnership) and Technical (CultivateCT, SoftenST) skills have shown initial psychometric support (Moyers et al., 2016); however, no studies have yet used the MITI 4.2 with a forensic population or to evaluate therapist behaviors in relation to participant outcomes. The main objective of this study was to examine the psychometric properties of the MITI 4.2 global scores with a sample of jail inmates, including both inter-rater reliability and predictive validity for post-intervention ratings of participant's motivation and confidence to change their substance use. The secondary objective of this study was to use the MITI 4.2 global scores to assess the associations between therapist skills and participants' characteristics for descriptive purposes.

2 Material & Methods

2.1 Participants

Data for this project were drawn from a parent study in which participants were recruited shortly before release from jail for a randomized clinical trial examining the impact of a brief motivational intervention on post-incarceration substance use (Owens & McCrady, 2016). A total of forty participants were consented into the original study and randomized to either the motivational ($n = 23$) or an educational ($n = 17$) intervention. For the current study, only the participants from the motivational intervention condition were included. One participant was excluded because the audio tape was not available due to recorder malfunction, leaving 22 participants for analysis. Briefly, the 22 participants were in their mid-thirties ($M = 34.8$, $SD = 10.5$) and this was a diverse sample: 7 identified as non-Hispanic White (31.8%), 5 as Native American/Alaskan Native (22.7%), 3 as Hispanic (13.6%), 3 as African American (13.6%), and 4 as bi- or multi-racial (18.1%). In the 90 days prior to incarceration, participants reported being completely abstinent from alcohol and drugs on 23.2% of days on average ($SD = 27.0$). Individuals had been incarcerated for an average of 55.0 months in their lifetimes ($SD = 54.6$) and had approximately 10 lifetime convictions ($SD = 10.1$). All participants signed a consent form and all procedures were approved by the University of New Mexico Institutional Review Board. For more

information on participants and procedures for the parent study, see Owens & McCrady (2016).

2.2 Measures & Procedures

The baseline interview consisted of an assessment battery, single motivational session, and post-intervention questionnaires. The assessment battery included measures of a) demographic information (CASAA Research Division, 1997); b) substance use using the Form-90 (Tonigan, Miller, & Brown, 1997) structured as the 90 days prior to incarceration; c) legal histories, including lifetime months incarcerated and number of convictions, using the Addiction Severity Index (McLellan et al., 1992); and d) motivation and confidence to change alcohol and other drug use, which were measured by a 0–10 scale (0 = “not at all” motivated/confident, 10 = “extremely” motivated/confident). The 60-minute motivational session used an MI approach to target alcohol and other drug use, social networks, and engagement in substance use treatment after release from jail, and were recorded with consent from the participants. Post-intervention, questionnaires reassessed participants’ motivation and confidence to change their substance use.

2.2.1 Fidelity measures—The global scores for the MITI 4.2 include: Empathy, Partnership, CultivateCT, and SoftenST. Each of these scores was rated on a 1–5 scale with increasing scores reflecting greater instances of positive related behaviors and fewer negative behaviors. Coders begin with a default score of “3” and then adjust scores as needed. Empathy assesses whether therapists demonstrate an attempt to understand and appreciate client’s situations and viewpoints. Partnership is a rating based on how therapists collaborate with clients as equal partners rather than assuming an expert role. CultivateCT captures the extent to which therapists elicit, encourage, strengthen, and reflect client statements toward change. Examples of client statements toward change, or change talk, are “My drug use keeps bringing me back to jail” or “I need to quit [drugs] for my family.” SoftenST measures how therapists deemphasize or circumvent client statements against change or statements that are in favor of the status quo (Moyers, Manuel, & Ernst, 2014). Client statements against change, or sustain talk, could include utterances such as, “I don’t know if I can cope without alcohol” or “I’m going to use again, it’s inevitable.” The summary scores derived from these ratings are: Relational score (an average of Empathy and Partnership) and Technical score (an average of CultivateCT and SoftenST). For more details about the measure and codes, the MITI 4.2 is available in the public domain at http://casaa.unm.edu/download/MITI4_2.pdf

2.2.2 Coders—Three undergraduate raters were trained in the MITI 4.2; details of their training and related procedures can be found elsewhere (Moyers et al., 2016). For the current study, weekly coding meetings were held to help prevent coder drift, during which the lab group reviewed results, discussed coding-related questions and difficult codes, and created decision rules as a group. In order to preserve an accurate estimate of inter-rater reliability, no coding data were changed as a result of these meetings, even when errors were apparent.

2.2.3 Reliability—A random 40% of the current study tapes (n = 9) were double coded and used to estimate inter-rater reliability. The senior coder for the study was designated as the

expert rater and the two others each randomly coded a subset of the expert's tapes. Inter-rater reliability was assessed with 2-way mixed effects, absolute agreement, single-measures intraclass correlations (ICC) for each individual item. This ICC was chosen based on the structure of this study and to meet the recent guidelines for using ICCs for inter-rater reliability described by Hallgren (2012). The benchmarks for ICCs followed the guidelines purported by Cicchetti & Sparrow (1981): 0.00–0.40 = poor, 0.40–0.59 = fair, 0.60–0.74 = good, and 0.75–1.00 = excellent.

2.2.4 Data analysis—The first aim of the study tested the psychometric properties of the individual MITI 4.2 global scores. Global summary scores (Relational, Technical) also were examined, because the inclusion of more items may improve overall reliability, making them better suited for analysis with this small sample size. In addition to the inter-rater reliability indices described above, we examined predictive validity using bivariate analyses and regression models to test the associations between MITI 4.2 global scores and post-intervention ratings of motivation and confidence to change alcohol or drug use. There were four outcomes used from these post-intervention ratings: a) motivation to decrease/change alcohol use, b) confidence to decrease/change alcohol use, c) motivation to decrease/change other drug use, and d) confidence to decrease/change other drug use. In the regression models, global scores were individually entered as predictors and controlled for corresponding baseline rating of motivation or confidence. For the second aim, bivariate analyses were used to describe the links between the MITI 4.2 global scores (four individual: Empathy, Partnership, CultivateCT, SoftenST; two summary scores: Relational, Technical) and participant characteristics. Participant characteristics included demographic characteristics, such as age (in years) and criminal history (lifetime number of convictions and lifetime months incarcerated). Analyses also examined the associations between MITI 4.2 global scores and participants' substance use prior to coming to jail. For this analysis, substance use was defined as percentage of days completely abstinent from alcohol and drugs during the 90 days prior to this incarceration.

3 Results

3.1 Psychometric Properties

Descriptive and reliability information for MITI 4.2 global scores is shown in Table 1. ICCs were in the excellent range. The exception was SoftenST, which was in the good range.

When examining predictive validity of the MITI 4.2, none of the global scores significantly correlated with ratings of motivation or confidence to decrease alcohol use (Table 2). There were positive associations between CultivateCT, and Relational and Technical scores with motivation to decrease drug use. Empathy was positively related to ratings of confidence to decrease drug use. No other global score was significantly correlated with any other rating.

After controlling for baseline ratings of motivation ($\beta = 0.686, p < 0.001$), the Technical score predicted post-intervention motivation to decrease drug use ($\beta = 0.306, p = 0.030$). Neither the individual MITI 4.2 scores nor the Relational summary score predicted post-intervention motivation and confidence ratings after controlling for pre-intervention ratings.

3.2 Participant Characteristics

Age and percent days abstinent from all substances were not significantly related to any MITI 4.2 scores (Table 2). Empathy and lifetime months of incarceration were negatively correlated, such that there were lower scores of Empathy for individuals with greater lifetime months of incarceration. Similarly, CultivateCT and overall Technical scores were negatively associated with criminal history for both lifetime number of convictions and months incarcerated.

4 Discussion

Results from this study support the conclusion that the MITI 4.2 can be used with acceptable reliability by trained coders when examining MI sessions for jail inmates with substance use disorders. These reliability outcomes are encouraging, particularly for this high-risk population where adaptations in the MI method might be observed. Further, the MITI 4.2 is one of the only existing tools that can measure the technical hypothesis of MI theory, making it a useful choice for studies attempting to evaluate fidelity in this component.

This paper also explored how therapists' MI skills were related to post-intervention ratings of motivation and confidence to change and found initial evidence of the predictive validity of the MITI 4.2, particularly as it relates to drug use-related outcomes (versus outcomes related to alcohol use). CultivateCT and the Relational and Technical scores were associated with post-intervention ratings of motivation to decrease drug use and, indeed, Technical scores predicted these ratings even after controlling for pre-intervention ratings of motivation. Empathy and SoftenST were not significantly related to post-intervention ratings of motivation to decrease drug use ($p < 0.10$). Because Technical scores are a combination of CultivateCT and SoftenST, this may mean that CultivateCT is accounting for the Technical score finding. Future research could address these and other questions using the MITI 4.2 with larger samples to better understand how CultivateCT and SoftenST may be differentially associated with participant outcomes.

The secondary objective of this study was to investigate how different participant characteristics were associated with behaviors of the therapist during the motivational session. To our knowledge, this is the first study to explore these new measures and relate them to inmate variables. We found that therapists tended to have lower scores of Empathy, CultivateCT, and Technical scores when working with inmates with more extensive criminal histories as compared to inmates with less extensive criminal histories. Although this study is limited by a small sample size and could not examine a causal relationship between MI skills and these variables, these findings may suggest that therapists have biases when working with individuals with greater legal involvement. Inmates with more significant criminal backgrounds may evoke fewer empathic statements from therapists; fewer empathic statements from therapists have important implications for the therapeutic relationship. Therapist empathy represents a desirable attribute for psychotherapy in general and, in particular, MI, due to the positive association between empathy and improved client outcomes (Gaume et al., 2008; Miller & Moyers, 2015). Given the positive association between empathy and client outcome, lower scores for participants with more lifetime convictions and months incarcerated is concerning. Coding sessions using the MITI 4.2 may

be especially valuable when training therapists working with jail inmates and other corrections populations in order to provide feedback and monitor therapist empathy.

Interestingly, given that both Relational and Technical ratings were lower for participants with more extensive criminal histories, this also may indicate that these MI skills are not separate, but rather are intertwined. MI theory purports that empathy and underlying spirit is a critical part of how MI works, and both are necessary to having technical skills (Miller & Rollnick, 2012; Miller and Rose 2009). In other words, it may be that a therapist cannot effectively employ technical skills without first establishing empathy and partnership in the interpersonal context. Future research should attempt to disentangle the association between Relational and Technical skills further and should examine how they may separately relate to client outcomes.

There are limitations of this study worth stating. First, the sample size from the original clinical trial was small and may not be representative of jail inmates with substance use disorders, which limits generalizability of the findings from the current study. Second, because of the small sample size, alpha levels were not adjusted for multiple comparisons, which increases the risk of making a Type I error. Studies with larger sample sizes of inmates are needed to replicate study findings, such as the association between Empathy and criminal histories. Third, only ratings of motivation and confidence to change substance use-related behaviors assessed immediately after the intervention were examined; future research should examine how MITI 4.2 codes may relate to longer-term outcomes, such as substance use or criminal recidivism six months to one year post-intervention. Fourth, the new Relational and Technical global scores were measured using Likert-type scales instead of behavior counts, making these global scores a rough first attempt at quantifying these constructs. It is possible that using behavior counts to measure therapists' skill with the Relational and Technical components of MI would yield more fine-grained results than the overall global scores. Fifth, some aspects of therapist skills may have been overlooked in this study, as the MITI 4.2 does not evaluate non-verbal behaviors, such as gestural mirroring or facial expression. Future research could explore adapting the Relational and Technical skill scores to account for visual data from video recordings (e.g., instances of smiling, posture toward the client).

4.1 Conclusions

The current study was one of the first to examine the psychometric properties of the new components of the MITI 4.2 coding system, and then assess how these components were associated with participant characteristics. Overall, the coding system showed strong inter-rater reliability. Results also demonstrated that it is possible to train new coders to use this treatment integrity measure to evaluate MI sessions with jail inmates. Both summary scores (Relational, Technical) and CultivateCT were associated with post-intervention ratings of motivation to decrease drug use, pointing to some evidence of the predictive validity of the MITI 4.2. Although this study was underpowered, even after controlling for pre-intervention ratings of motivation to decrease drug use, the Technical score still predicted post-intervention ratings, providing support for the technical hypothesis of MI. When interacting with inmates with more extensive criminal histories, therapists received lower scores in

Empathy, CultivateCT, and Technical scores, indicating potential differences in the administration of MI across inmate characteristics. Future studies should attempt to replicate these findings with other corrections samples to add to the evidence on the psychometric soundness of the MITI 4.2 and to better understand how this therapy approach may be helpful for this high-risk population.

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Highlights

- The Motivational Interviewing Treatment Integrity coding system (MITI) was examined.
- The MITI demonstrated strong reliability with a novel sample: jail inmates (n=22).
- Therapists were rated as being less empathic with clients with more extensive criminal histories.
- Relational and Technical scores were related to criminal history and motivation to change use.
- Results supported the relational and technical hypotheses of Motivational Interviewing theory.

Table 1
Motivational Interviewing Treatment Integrity Coding System Descriptive Statistics and Reliability

Variable	<i>M</i>	(<i>SD</i>)	ICC
Global Scores			
Empathy	4.5	(0.5)	.808**
Partnership	4.3	(0.6)	.878**
Cultivate Change Talk (Cultivate CT)	4.6	(0.6)	.859**
Soften Sustain Talk (Soften ST)	4.3	(0.8)	.738*
Summary Scores			
Relational	4.5	(0.6)	
Technical	4.4	(0.4)	

Notes. Global scores and related summary scores were rated on a 1–5 Likert-type scale where 1 = “Low” and 5 = “High.” Benchmarks for ICCS: 0.00–0.40 = poor, 0.40–0.59 = fair, 0.60–0.74 = good*, and 0.75–1.00 = excellent** (Cicchetti & Sparrow, 1981).

Correlations among Motivational Interviewing Treatment Integrity Coding System Scores and Participant Characteristics and Ratings

Table 2

	Participant Characteristics				Post-Intervention Ratings			
	Age	PDA	Lifetime Convictions	Lifetime Incarceration	Motivation Alcohol	Confidence Alcohol	Motivation Drugs	Confidence Drugs
Empathy	-0.019	-0.043	-0.259	-0.589 ^{**}	0.251	0.339	0.414 ⁺	0.509 [*]
Partnership	-0.154	-0.148	-0.180	0.176	-0.210	-0.330	0.207	0.042
CultivateCV	-0.298	-0.373 ⁺	-0.609 ^{**}	-0.530 [*]	0.344	0.144	0.584 ^{**}	0.327
SoftenST	-0.092	-0.101	-0.154	-0.225	0.028	0.135	0.394 ⁺	0.296
Relational	-0.123	-0.134	-0.301	-0.265	0.016	-0.011	0.424 [*]	0.368 ⁺
Technical	-0.220	-0.265	-0.425 [*]	-0.434 [*]	0.200	0.169	0.579 ^{**}	0.376 ⁺

Notes.

^{*} $p < 0.05$;

^{**} $p < 0.01$.

⁺ $p < 0.10$.

Significant values are bolded for emphasis. CultivateCV = Cultivating Change Talk. SoftenST = Softening Sustain Talk. PDA = percent days abstinent from alcohol and drugs. Lifetime incarceration = lifetime months of incarceration.