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Change Talk and Relatedness in Group Motivational Interviewing: A Pilot Study

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Abstract

Background—Change talk (CT), or client speech in favor of change, is a hypothesized mechanism of action in motivational interviewing (MI) for substance use disorders. Although group-based treatment is the primary treatment modality for the majority of clients seeking substance use treatment, limited research has examined group motivational interviewing (GMI) among this population, and no study has examined CT within GMI. Therefore, in the current study we examined both standard CT (e.g., desire, ability, reason, need) and a novel phenomenon involving CT which we termed ‘*relatedness*,’ or the synergistic exchange of CT between and among group members.

Method—Data were utilized from an ongoing randomized controlled trial (RCT) examining the effectiveness of GMI relative to a treatment control condition (TCC) among U.S. veteran outpatients with a primary alcohol use disorder at a Veterans Affairs hospital. A subsample of participants ($n = 52$) from the RCT were randomly assigned to receive GMI or TCC. The majority of participants in the subsample had co-existing psychiatric (88%) and dual diagnosis drug use disorders (38%). Two of four treatment sessions were coded by trained raters for CT and *relatedness*.

Results—Analyses demonstrated that CT and *relatedness* occurred with greater frequency in GMI compared to TCC, with effect sizes in the large range for each difference. Results held after controlling for number of group members in treatment sessions.

Conclusions—Findings suggest that GMI is associated with more frequent CT and *relatedness* than TCC, consistent with the broader literature demonstrating the influence of MI on CT.

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Change talk; Motivational interviewing; Group motivational interviewing; Substance use; Relatedness

1. Introduction

Previous research has demonstrated strong evidence for the efficacy of motivational interviewing (MI) for substance use disorders (Hettema, Steele, & Miller, 2005; Lundahl, Kunz, Brownell, Tollefson, & Burke, 2010). Although the active ingredients by which MI works remain unclear, one hypothesized mechanism of action is the enhancement of client change talk (CT), which includes statements that convey a client's desire, ability, reason, need, commitment to, and reports of taking steps toward, change (DARN-CT; Amrhein, 2004; Apodaca & Longabaugh, 2009). Using MI consistent behaviors, such as recognizing and eliciting CT through reflections and evocative open-ended questions, among other MI strategies, clinicians may directly influence the frequency by which clients verbalize statements that favor change (Glynn & Moyers, 2010). Indeed, research has demonstrated that CT is enhanced in MI for substance use disorders (e.g., Morgenstern et al., 2012; Moyers & Martin, 2006) and has been shown to predict reduced substance use in some studies (e.g., Amrhein, Miller, Yahne, Palmer, & Fulcher, 2003; Moyers, Martin, Houck, Christopher, & Tonigan, 2009; Vader, Walters, Prabhu, Houck, & Field, 2010).

Due to economic, staffing, and other constraints, the majority of substance use treatment facilities employ group treatment as their modal form of intervention (Kaminer, 2005). However, MI was originally developed as an individual therapeutic approach and, thus, required adaptation for it to be used in group treatment programs (Drake, Mueser, Brunette, & McHugo, 2004; Goldsmith & Garlapati, 2004). Many therapists have begun to apply MI in group settings (Wagner & Ingersoll, 2012), allowing it to be available to a broader number of substance using clients who would otherwise not receive this intervention in treatment settings relying on group therapy. Despite these recent adaptations, research in this area remains nascent. One prior study demonstrated that participants who elected to attend treatment attended more aftercare treatment sessions following GMI relative to a therapist attention activity control group; and participants who continued to use substances consumed less alcohol and engaged in less binge drinking at follow-up if they received GMI relative to the control intervention (Santa Ana, Wulfert, & Nietert, 2007). Other studies have demonstrated similarly promising outcomes for GMI with methadone maintenance patients (Nyamathi et al., 2010) and college students (Fromm & Corbin, 2004; LaBrie, Thompson, Huchting, Lac, & Buckley, 2007, 2009; Hustad et al., 2014).

GMI, similar to individual MI, aims to engage clients in an empathic and collaborative conversation, focus them on behavior change targets, evoke CT, and depending on the members' readiness for change, initiate change planning (Martino & Santa Ana, 2013; Miller & Rollnick, 2013; Santa Ana & Martino, 2009). Unlike individual MI, therapists in GMI also promote group therapeutic factors, such as those outlined by Yalom (1995), including group cohesiveness, instillation of hope, and universality, to name a few. In practice, this promotion means that GMI therapists reflect common themes evident among

several group members' CT statements (e.g., "Regaining one's self-respect seems to resonate with a lot of people"). In addition, therapists encourage group members to consider how other members' CT may apply to themselves (e.g., "Larry said he hoped to have a job in 1 year if he remains clean and sober. Where do you see yourself headed if you do the same?"). Thus, in GMI, therapists meld traditional MI strategies with group facilitation techniques to encourage the elicitation and development of CT among and between group members.

Conceptually, GMI aims to achieve a synergy between MI strategies and group therapeutics for the purpose of evoking CT, such that CT springs between and among the group members. Thus, in GMI, therapists foster a group process that cultivates clients' CT related to the CT of their peers (henceforth referred to as '*relatedness*'). Observably, evidence of *relatedness* would be sequential CT statements from one group member to another, as opposed to CT statements that are solely elicited in direct interaction with the therapist. Indeed, therapists in GMI are expected to both directly evoke CT from individual members and simultaneously facilitate the group process to support CT among peers. To our knowledge, no known research has examined processes within GMI pertaining to the synergistic exchange of CT among group members. Evidence of *relatedness* would provide support for the molding of traditional MI strategies with group therapeutic factors, which are central to GMI. Since the enhancement of CT is a crucial mechanism of action in individual MI (Moyers et al., 2007), it is important to demonstrate whether GMI may operate in similar ways and to determine if other theorized mechanisms of action may be at play.

Therefore, in the current study, we examined the occurrence of CT (i.e., DARN-CT; Amrhein, 2004) and *relatedness* among a subsample of participants in a larger ongoing randomized controlled trial (RCT) of GMI in a primarily dual-diagnosis sample of veterans with substance use disorders (Santa Ana, Lamb, Morgan-Lopez, & LaRowe, 2013). We examined whether (1) *relatedness* could be reliably rated in GMI; (2) a greater amount of CT, with regard to its frequency and strength, occurred in GMI relative to a treatment control condition (TCC); and (3) a greater amount of *relatedness* occurred in GMI relative to TCC. Secondly, to evaluate whether *relatedness* and CT were non-overlapping and discriminable, we conducted a series of bivariate correlations to examine their relationship. We additionally examined whether therapist GMI skills (i.e., therapist MI adherent and non-adherent behaviors) were associated with CT and *relatedness*.

2. Method

2.1. Participants

The current study utilized a subsample of participants ($n = 52$) from an ongoing RCT ($N = 118$) described below. Table 1 provides demographic and diagnostic information for the study sample. All participants had an alcohol use disorder and the majority have coexisting psychiatric (88%) and dual diagnosis drug use disorders (38%). There were no significant treatment condition differences on demographic or diagnostic variables.

2.2. Procedures

2.2.1. Recruitment and randomization—Patients were recruited between May 2010 and November 2012 through an outpatient substance abuse treatment center (SATC) at the Ralph H. Johnson Veterans Affairs Medical Center in Charleston, South Carolina. Recruitment occurred from several sources: health professionals (nurses and psychiatrists) referred patients seen in psychiatric triage services for a substance abuse problem, patients referred themselves based on “word-of-mouth” or in response to study flyers placed in substance abuse triage offices and in patient group rooms, or in response to a research assistant informing patients about the study in the substance abuse outpatient treatment orientation group. None of the participants were formally engaged in substance use treatment at the time of their consent in the study. Eligibility required participants to have a current diagnosis of alcohol dependence or abuse. Participants with comorbid drug or *DSM-IV-TR* Axis I disorders (American Psychiatric Association, 2000) were included in the study. Psychiatric diagnoses were determined through the Structured Clinical Interview for *DSM-IV* (SCID; First, Spitzer, Gibbon, & Williams, 2002), administered by trained research assistants. Participants were not excluded if they were engaged in other forms of mental health treatment. All procedures were approved by the Institutional Review Boards of the last authors’ institutions and all patients provided informed consent prior to participation.

After completing informed consent, participants were randomly assigned, using a block randomization procedure (i.e., with “recruitment week” as the unit of randomization), to GMI or TCC, after which they attended their four GMI or TCC sessions. Each session lasted approximately 75 minutes, with the number of participants in each block/cohort ranging from two to five group members. The average wait time between study consent and attendance at the first treatment session was 1 week. Due to required staff schedules in the naturalistic setting of the SATC outpatient program, therapists rotated sessions so that each session was conducted by a different therapist. Sessions were spaced over the course of 4 ‘back-to-back’ days (e.g., Tuesday through Friday). This was done because previous research demonstrated favorable results for GMI when sessions were delivered on consecutive days (Santa Ana et al., 2007).

2.2.2. Treatment conditions—Participants randomized to GMI received four structured, back-to-back, 75-minute sessions in 1 week consistent with the central principles and spirit of MI (Miller & Rollnick, 2013) and based on a manualized protocol (Martino & Santa Ana, 2013; Santa Ana & Martino, 2009). Designed for dually diagnosed patients, a focus of the intervention is to examine the relationship between the substance use and the co-existing psychiatric disorder(s) and the importance of proactively treating both conditions. Session 1 introduced the guidelines of group behavior (e.g., the GMI normative culture) to create an atmosphere consistent with MI behaviors (e.g., avoid use of labels; avoid giving advice without requesting permission), explored common emotions (e.g., anxiety, fear) associated with ambivalence to change, underscored client autonomy, and evaluated pros/cons of substance use and readiness/confidence to change. Session 2 aimed to develop discrepancy between the clients’ substance use and their preferred goals and values through the use of a personalized feedback intervention utilizing graphical data derived from the baseline study assessments. Session 3 explored and clarified goals/values, addressed ability to change, and

engaged members in a discussion on the interrelationship between their substance use and co-existing psychiatric disorder(s). Session 4 enhanced intrinsic motivation to attend treatment by problem solving barriers for continuing treatment for both the substance use and other co-existing psychiatric disorder(s).

TCC was designed as a psycho-educational group (e.g., addiction as a chronic disease, relapse prevention, developing a plan to prevent relapse), delivered with the aid of sequential standardized PowerPoint presentations. Group members were encouraged to ask questions and make comments. Therapists were encouraged to conduct the sessions using an instructional quality that minimized the use of MI strategies. TCC consisted of four sessions, lasting 75 minutes, and was conducted on four consecutive days within the course of 1 week.

2.2.3. Therapist GMI and TCC training—In this subsample from the overall study, therapists were four psychologists, one nurse, and one social worker with at least 6 or more years of clinical practice in substance abuse treatment in individual and group settings. Five of the six therapists provided both GMI and TCC, while the remaining therapist provided only TCC.

A licensed psychologist, who is an active member of the Motivational Interviewing Network of Trainers with approximately 13 years of experience delivering and training MI and GMI, trained study therapists. For GMI, training began with a 20-hour workshop delivered over the course of 3-days, consisting of intensive instruction on the GMI treatment manual (Santa Ana & Martino, 2009) utilizing video, live demonstration, and role-play practice. GMI therapist practice-sessions followed within 3 weeks of the workshop training with volunteer patients who elected to attend GMI sessions. All therapists practiced delivering the GMI practice sessions with volunteer patients for each of the four treatment sessions. Direct observation based on audio recorded sessions, followed by immediate feedback, was provided to all therapists. Similar to other MI protocols delivered in community substance abuse treatment programs (Ball et al., 2007; Carroll et al., 2000), practice sessions continued until therapists demonstrated adequate use of MI skills and implementation of GMI activities before they began to see participants in the clinical trial.

Training in the TCC condition involved a 6-hour workshop for the 4 treatment sessions followed by practice sessions with volunteer patients for each of the four treatment sessions prior to participant recruitment. Therapists also were instructed how to use participant handouts and conduct TCC activities. Direct observation of TCC practice sessions, followed by immediate feedback, was provided to study therapists from the last author. Once participant recruitment commenced, weekly supervision of study therapists for both treatment conditions (provided by the last author) was ongoing throughout the project via review, feedback and coaching based on audio recorded sessions.

2.2.4. Session selection for coding—For the purposes of the present study, we examined CT and *relatedness* in sessions 1 and 4 to determine the frequency and strength of CT at the beginning and end of treatment. Sessions 1 and 4 were selected for rating change talk as we anticipated that these sessions would contain maximal opportunities for both CT

and *relatedness* to occur. Group members in these sessions participated in several interactive activities, such as group discussions involving various open-ended questions (e.g., “What, if anything, does treatment have to offer you?”) and brainstorming for solutions, in a collaborative team-approach, for staying in treatment despite obstacles with which group members could relate. Sessions were selected randomly, with the caveat being that each cohort of group members was represented only once (either in session 1 or session 4) in order to retain independence of observations for statistical analyses. Cohort sizes across GMI ($M = 2.78$; $SD = .66$) and TCC ($M = 2.63$; $SD = .52$) were equivalent.

2.2.5. MI integrity, CT, and relatedness coding training—Two undergraduate coders received approximately 40 hours of training from the last author in rating MI integrity and CT on the MITI (Moyers, Martin, Manuel, Miller, & Ernst, 2010) and MISC (Miller, Moyers, Ernst, & Amrhein, 2008). Training consisted of an in-depth review of the coding manuals and discussing coding guidelines per item, followed by coding practice sessions, starting with easier to more complex therapist and client utterances using taped examples. Weekly supervision meetings with the last author involved discussing the ratings and resolving any rating discrepancies during coding practice and reviewing the coding manuals when necessary to clarify coding procedures. Weekly meetings continued until both coders were no more than 1 Likert-scale point discrepant on global ratings and demonstrated no more than a 10% difference in behavioral frequency counts for therapists and participants across three practice coding sessions. After the completion of training, coders independently rated seven common audio recorded sessions, randomly selected across therapists and sessions, to determine inter-rater reliability for MI Integrity and CT.

Once coding was completed for MI integrity and CT, the two coders participated in a third training phase consisting of 40 hours of in-depth review of the *relatedness* coding protocol, including guidelines for coding *relatedness*, coding practice sessions, discussing and resolving discrepancies and reviewing the relatedness coding manual when necessary to resolve differences. Coders received weekly supervision meetings consisting of practice sessions until no more than a 10% difference in behavioral frequency counts occurred across 5 practice coding sessions. Immediately after the *relatedness* training, coders independently rated seven common audio recorded sessions, randomly selected across therapists and sessions, to determine inter-rater reliability. Coders were blind to treatment conditions and coded sessions three times: first for assessing MI integrity, second for assessing CT, and the third coding for *relatedness*. Audio recordings used for coding practice sessions were not used in the study data set. For both CT and *relatedness*, the Targeted Behavioral Outcome for rating purposes included statements concerning substance use and treatment engagement, which could have been in reference to either substance use or mental health.

2.3. Measures

2.3.1. MI integrity—The Motivational Interviewing Treatment Integrity (MITI) code, version 3.1.1 (Moyers et al., 2010) assessed therapist integrity and treatment discriminability between treatment conditions in the delivery of MI. The MITI, an empirically validated instrument that measures therapists’ MI adherence and competence in both individual and group settings (D’Amico et al., 2012), consists of two components: five global dimensions

(evocation, collaboration, autonomy/support, direction, and empathy) assessed on a Likert-scale (1 = low adherence; 5 = high adherence), and seven MI behavioral frequency counts (specific instances of ‘giving information, MI adherence, MI non-adherence, open-ended questions, closed questions, simple reflections, and complex reflections’). These MITI categories were collapsed into three groups: (a) Global Totals (i.e., the combined global scores); (b) MI adherent behaviors (i.e., the combined frequency of MI adherent behaviors, including asking permission, making affirmations, imparting autonomy, open-ended questions, simple reflections, and complex reflections); and (c) MI non-adherent behaviors (the combined frequency of MI non-adherent behaviors including advising, confronting directing, and giving information non-adherently).

2.3.2. Change talk (CT)—An adapted version of the Motivational Interviewing Skill Code protocol, version 2.1 (Miller et al., 2008), was used to code client CT across treatment groups. While the MISC consists of global ratings and behavior counts for the therapist and the client, only the clients were rated for CT using the MISC. Six specific types of CT (desire, ability, reason, need, commitment, and taking steps) were coded based on their *frequency* (number of individual client utterances or complete thoughts). Ratings of CT *strength* (or ‘*extensiveness*’) (i.e., the degree to which each of the six types of CT were discussed using 1 = not at all, 2 = a little, 3 = infrequently, 4 = somewhat, 5 = quite a bit, 6 = considerably, and 7 = extensively) was assessed using modified rating guidelines from the Independent Tape Rater Guide (Ball, Martino, Corvino, Morgenstern, & Carroll, 2002) that focused on the group members, as opposed to the therapist.

2.3.3. Relatedness—A standard protocol that operationalized *relatedness* and provided specific examples (see examples of *relatedness* in Table 2) was used to code *relatedness* across treatment groups. For rating purposes, sessions were transcribed. *Relatedness* was operationalized as: (1) CT that occurs on the heels of another group member’s CT and not in response to a direct question or reflection from the therapist; (2) CT that arises from a topic being discussed by group members and not made in direct response to the therapist; and (3) CT that references the group as a whole. To capture the interactive nature of *relatedness*, each group member’s statements involved in the above transactions were coded for *relatedness*. For example, when a group member asked a question and another group member answered the question in the form of CT, both comments were coded as instances of *relatedness*. Within the transcripts, instances of *relatedness* were noted with ‘hash marks’ after identifying *relatedness* utterances. *Relatedness* frequency was determined by tallying the hash marks.

2.3.4. Treatment Components Checklist—A Treatment Components Checklist was also prepared for the study and consisted of twenty-six structured activities (average of 6.5 activities per treatment session) specific to the GMI (e.g., establishing group norms, normalizing ambivalence, values clarification, exploring personal strengths, relationship between mental health and substance use) and TCC (e.g., disease concept of addiction, effects and consequences of alcohol and drugs, relapse prevention, lifestyle changing) treatment conditions. The Treatment Components Checklist was used to evaluate therapist adherence on the delivery of treatment activities within each condition and to ensure that

there was non-contamination in session activities between GMI and TCC. Coders independently rated five common audio recorded sessions randomly selected across therapists and sessions to determine inter-rater reliability.

2.4. Data analytic strategy

Inter-rater reliability for MI integrity, CT, *relatedness*, and the Treatment Components Checklist were estimated using intra-class correlations (ICCs; Shrout & Fleiss, 1979). ICCs are categorized as: $<.40$ = poor; $.40$ to $.50$ = fair; $.60$ to $.74$ = good, and $.75$ to 1.00 = excellent (Cicchetti, 1994). Independent samples *t* tests were conducted to determine whether MI adherence and competence varied across treatment conditions. Similarly, independent samples *t* tests were conducted to determine whether GMI evidenced higher frequency and strength of CT and *relatedness* than TCC. Due to the potential for confounding variables specific to group treatment (e.g., number of group members, cohort effects, therapists), we examined whether potential confounding variables were associated with CT and *relatedness* using bivariate correlations, *t* tests, and analysis of variance (ANOVAs). When a confounding variable was associated with *relatedness*, we used analysis of covariance (ANCOVA) to control for their effects when examining differences between treatment groups. Finally, we examined the relationship between *relatedness* and CT and the association between GMI therapist skills (e.g., therapist MI adherent and non-adherent behaviors) and CT and *relatedness* using bivariate correlations.

3. Results

High degrees of inter-rater reliability (ICCs) were found for MI Global Totals (ICC = .89; 95% CI = .27–.99), MI adherent behaviors (ICC = .95; 95% CI = .61–.99), and MI non-adherent behaviors (ICC = .88; 95% CI = .25–.99). There were significant differences between treatment groups on MI Global Totals, $t(13) = 7.71, p < .001$, and MI adherent behaviors, $t(13) = 2.98, p < .01$, indicating that therapists in GMI ($M = 31.00, SD = 3.11$ and $M = 9.87, SD = 4.18$, respectively) had higher MI Global Totals and MI adherent behaviors compared to therapists in TCC ($M = 22.06, SD = 1.01$ and $M = 4.50, SD = 2.72$). There was no significant difference between TCC and GMI on MI non-adherent behaviors, $t(13) = 1.86, p = .08$ ($M = 1.87, SD = 2.62$ and $M = 0.00, SD = 0.00$, respectively). However, the effect size for this difference was in the large range ($d = 1.00$; Cohen, 1988).

As displayed in Table 3, high degrees of inter-rater reliability were found for desire, ability, reason, need, commitment, and taking steps CT. Additionally, a high degree of inter-rater reliability was found for *relatedness* (Table 3), supporting our first aim demonstrating that *relatedness* can be reliably rated.

A high degree of inter-rater reliability was also found for the Treatment Components Checklist scores (ICC = .95; 95% CI = .57–.99). Percent of therapist adherence to the treatment activities recommended per session was 85.8% in GMI and 77.2% in TCC.

We next examined differences between treatment conditions on CT. Results demonstrated that participants in GMI, relative to TCC, expressed desire, ability, reason, need, and all combined CT more often (see Table 3). No differences were found between treatment

conditions on commitment or taking steps CT. However, all differences between groups fell into the large effect size range. Analyses examining strength of CT, or the ‘extensiveness’ of CT, showed that participants in GMI exhibited greater CT strength for each CT category than their counterparts in TCC (see Table 4). Number of group members present in each treatment session, cohort (chronological time point at which the group members were recruited), and study therapist (specific therapist who provided the treatment condition) were not significantly associated with CT frequency or strength. There was more frequent desire CT in session 1 ($M = 8.44$, $SD = 10.39$) than in session 4 ($M = .38$, $SD = .74$), $t(15) = 2.18$, $p < .05$. The strength of desire and need CT were greater in session 1 ($M = 4.11$, $SD = 2.47$ and $M = 4.78$, $SD = 2.48$, respectively) relative to session 4 ($M = 1.63$, $SD = 1.41$ and $M = 2.38$, $SD = 1.84$, respectively) [$t(15) = 2.50$, $p < .05$ and $t(15) = 2.23$, $p < .05$, respectively]. There were no other significant differences between sessions on different types of CT.

Next, we examined the association between *relatedness* and potential confounding variables, including session length, number of group members present in treatment sessions, session number (first or fourth session), therapists, and cohort. Session length and number, therapists, and cohort were all unrelated to *relatedness* (p 's $> .18$). There was a significant association between number of group members present in treatment sessions and *relatedness* ($r = .65$, $p < .01$), such that more group members present in treatment sessions was associated with higher levels *relatedness*. Because number of group members present in treatment sessions was the only variable associated with *relatedness*, all other variables were excluded in further analyses.

We next examined differences in *relatedness* among treatment conditions. Results demonstrated that *relatedness* occurred more frequently in GMI relative to TCC (see Table 3). This difference fell into the large effect size range ($d = 1.15$). Additionally, results of an ANCOVA, with number of group members present in treatment sessions included as the covariate, demonstrated that treatment conditions remained significantly different on *relatedness*, $F(1, 14) = 6.07$, $p < .05$. Number of group members in treatment sessions remained significantly associated with *relatedness* in this model, $F(1, 14) = 12.41$, $p < .01$.

Secondary analyses involving bivariate correlations between *relatedness* and CT were conducted. These findings are displayed in Table 5. As displayed, no significant correlations were found between *relatedness* and any type of CT. With the exception of the correlations between taking steps and desire and reason, all types of CT were positively and significantly associated with each other. Lastly, analyses involving bivariate correlations between GMI therapist skills and CT, and GMI therapist skills and *relatedness*, were conducted. These findings are displayed in Table 5. MI adherent behaviors were positively associated with desire, ability, reason, need CT and total CT, while non-adherent therapist behaviors was not significantly associated with CT or *relatedness*. Therapist Global Totals was positively associated with desire, reason, need, commitment, and total CT as well as *relatedness*.

4. Discussion

We investigated a novel phenomenon, referred to as *relatedness*, which is presumed to arise in GMI sessions as a result of the specific clinical actions of the therapist. *Relatedness* is the

synergistic exchange of CT between and among group members that is not in response to a direct question or reflection from the therapist. Therapists attempt to elicit *relatedness* by using reflections that convey the experiences of several group members simultaneously or by encouraging members to relate to one another's CT statements. The findings in the current study demonstrate that *relatedness* may be reliably measured in GMI and within groups that were psychoeducational in nature (TCC). GMI had a higher frequency of *relatedness* than TCC. Moreover, findings demonstrated greater frequency and strength (i.e., extensiveness) of CT (i.e., desire, ability, reason, need) in GMI relative to TCC. GMI therapist skills (i.e., therapist MI Adherent and Global Totals) were positively associated with client CT and *relatedness*, while non-adherent therapist behaviors showed no relationship to CT or *relatedness*.

These findings are consistent with the broader research in the MI literature showing that MI interventions enhance client CT (Barnett et al., 2014; Gaume et al., 2010; Moyers & Martin, 2006). However, to our knowledge, this is the first study to demonstrate that CT is enhanced in GMI. This finding is important, as it demonstrates that one of the hypothesized mechanisms of action for MI, client CT, also occurs in GMI to a larger degree than other group treatments, such as psychoeducational ones. Given the high level of MI adherence and competence demonstrated by study therapists, the enhanced CT in GMI was likely due to the specific MI strategies employed, as has been found for individually delivered MI (Barnett et al., 2014; Moyers & Martin, 2006). Indeed, our correlation analyses supported the relationship between MI adherent behaviors and CT. Future studies are needed to determine whether client CT in GMI mediates patient outcomes (e.g., reduced substance use), similar to results from individual MI studies (Miller & Rose, 2009; Moyers et al., 2009).

One surprising finding was the lack of significant association between *relatedness* and CT, given that the occurrence of *relatedness* requires the presence of CT exchanges between group members. Several possible interacting factors may have contributed to this outcome. First, the small sample size within our pilot study likely reduced statistical power to detect significant lower magnitude associations. Second, CT was coded anytime a client spoke in a manner that favored change. *Relatedness* was coded only in CT exchanges among group members, thereby providing a frequency ceiling below that which could be achieved within CT coding. Third, *relatedness* coding did not account for the type of change talk used in the exchanges, further diluting potential relationships between *relatedness* and change talk categories. Future research using larger rating samples will need to continue to explore the relationship between *relatedness* and CT.

Nonetheless, our findings suggest that GMI includes more than the therapist's elicitation of individual client CT. It is likely that GMI therapists encourage CT exchanges between and among clients, which may uniquely contribute to motivational enhancement. *Relatedness* may also develop, in part, when group members are encouraged to behave in MI consistent ways (i.e., to be warm and encouraging, impart autonomy). Supportive of this notion, a recent study on MI demonstrated that, when patients received MI in the presence of their significant other (SO), it was language supporting change by the SO that predicted patient's increased CT and lowered sustain talk, whereas the therapist's behavior was an inconsistent or weak predictor of CT (Apodaca, Magill, Longabaugh, Jackson, & Monti, 2013).

Moreover, *relatedness* is consistent with one of the hypothesized reasons as to why group treatment for substance use disorders produce beneficial effects: through support and modeling of effective behavior among group members (Moos, 2007).

These findings should be considered preliminary, however, until replicated and extended in future research. Further refinement of the operational definition and coding procedures for *relatedness* may be warranted. For example, we did not code instances when one client's statement disfavoring change (e.g., "AA doesn't help me") prompted another client's CT (e.g., "I can't speak for you, but they have helped me a lot."). While these instances could devolve into argumentation, they might enhance CT among other group members. Research also is needed on the relationship of *relatedness* to group cohesion and therapeutic alliance, important predictors of group therapy outcome (e.g., Marziali, Munroe-Blum, & McCleary, 1997). These factors may impact *relatedness*, such that the greater cohesion/alliance within the group, the greater the *relatedness*. Moreover, since number of group members in each session was positively associated with *relatedness*, research is needed to determine the ideal number of group members in each session in order to enhance CT exchanges, as it is possible that too many group members may become an obstacle to *relatedness* due to fewer opportunities for group members to speak. Finally, research is needed to examine whether *relatedness*, as well as the interaction between standard CT and *relatedness*, predict treatment outcomes.

The current study also has several limitations. The results were based on a relatively small sample size involving a predominantly male Veteran population. Future research should include larger samples, more women and non-Veterans, and inclusion of client populations with a wider array of psychiatric conditions to determine the generalizability of *relatedness*. We also did not code for sustain talk, or statements that disfavor change. A recent meta-analysis demonstrated that sustain talk was a predictor of poor client outcomes, and that the dynamic interplay of change talk, sustain talk, and the resolution of ambivalence toward change needs more attention in MI process research (Magill et al., in press). Hence, future research should code for both change talk and sustain talk in GMI. In addition, since analyses were based on the first and fourth GMI and TCC treatment sessions, future research should code all sessions for client statements for and against change, as well as *relatedness*, to determine growth in these constructs across treatment. Moreover, while *relatedness* occurred to larger degree in GMI compared to TCC, this phenomenon is not distinctive to GMI and is likely to be an active mechanism in other types of group therapies, including group cognitive-behavioral interventions and 12-step facilitation groups, similar to findings that client CT occurs in other therapies (Moyers et al., 2007). Finally, we did not examine the extent of particular group dynamic factors (i.e., level of group cohesiveness, universality) occurring in the GMI and TCC treatment conditions (Yalom, 1995), or the causal chain of events leading to *relatedness* that might be accomplished using sequential analysis.

In summary, to our knowledge, this is the first known investigation to examine CT within GMI, compared to TCC, among outpatients with a substance use disorder and co-occurring mental health diagnoses. Findings demonstrated greater CT in GMI relative to TCC. Moreover, we identified a novel phenomenon related to client CT, referred to as

'*relatedness*,' that appears to be enhanced in GMI for substance use; in particular, *relatedness* occurred to a larger degree in GMI compared to TCC. Pending replication and extension, the phenomenon of *relatedness* may have important implications for enhancing treatment outcomes among diverse, dually diagnosed patients with substance use disorders when treated with GMI.

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Table 1

Participant demographics and diagnoses.

	GMI (<i>n</i> = 30)	TCC (<i>n</i> = 22)	<i>p</i>
Gender			.13
Male, <i>n</i>	27	22	
Female, <i>n</i>	3	0	
Age, <i>M</i>	52.83	47.73	.07
	(<i>SD</i> = 8.06)	(<i>SD</i> = 11.73)	
Race, <i>n</i>			.47
African American	17	11	
Caucasian	13	10	
“Other”	0	1	
Education, <i>n</i>			.25
High school	13	6	
Some college	8	13	
College graduate	9	3	
Income, <i>n</i>			.88
\$19,999	17	13	
\$20,000–49,000	9	7	
\$50,000	4	2	
Marital status, <i>n</i>			.25
Never married	4	4	
Separated	4	2	
Divorced	12	3	
Married	8	10	
Widowed	2	3	
Alcohol diagnosis, <i>n</i>			.91
Abuse	3	2	
Dependence	27	20	
Drug diagnosis, <i>n</i>			.48
Opioid dependence	0	1	
Cocaine dependence	8	6	
Cocaine abuse	0	1	
Marijuana dependence	1	2	
Sedative/hypnotic/anxiolytic dependence	1	0	
Comorbid diagnosis, <i>n</i>			.49
None	3	3	
Major depressive disorder	4	3	
Depression NOS	10	3	
Bipolar I	2	1	
Bipolar II	1	0	
Mood disorder NOS	1	0	

	GMI (<i>n</i> = 30)	TCC (<i>n</i> = 22)	<i>p</i>
Substance induced mood disorder	2	1	
Schizoaffective disorder	0	1	
Psychotic disorder NOS	14	0	
Posttraumatic stress disorder	1	7	
Anxiety NOS	1	3	
Generalized anxiety disorder	1	0	

Note: GMI = group motivational interviewing; TCC = treatment control condition; NOS = not otherwise specified; *t* tests were employed to examine differences between groups on continuous variables and chi-squares for categorical variables.

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Table 2

Examples of *relatedness*.

Related CT prompted by the therapist's reflection of a common theme:

Therapist: "So we've heard about some examples about how not drinking can improve our lives."

Member 1: "What happened when you stopped drinking?"

Member 2: "**My wife and kids started talking to me again.**"

Group Member 3: "**Boy, I'd like to have that happen to me...I haven't seen my grandbaby since he was born.**"

Related CT that arises from a topic being discussed by group members:

Group member 1: "**You can't get your guard down. You have to be aware of triggers all the time. That what I do.**"

Group member 2: "**Yes, be vigilant**—sometimes I don't know if I'm in the middle of a trigger because I may not be paying attention. **Over time, I get used to figuring it out and it gets easier.**"

Group member 3: "What things catch you off guard?"

Group member 2: "Oh you know, I'm walking down the street and I run into my dealer in a different part of town. That's happened to me —**I've had to deal with it right there and then—didn't give in to it. I have to keep doing that.**"

Group member 1: "**You really caught yourself—I've had to deal with that and it sure wasn't easy, but I managed.** How did you deal with it when you ran into him?"

Related CT prompted by the therapist asking an evocative question of the entire group:

Therapist: "In what way is it better for all of you to choose your own treatment?"

Member 1: "**We have got to manage our problems; our problems are not anybody else's.**"

Member 2: "**When we are serious about taking care of our problems, we'll do it and that includes deciding what treatment we want to have.**"

Member 3: "**Yeah and I think we all will get better results if we're doing it for ourselves.**"

Note: sequential CT demonstrating *relatedness* depicted in bold text.

Table 3Change talk and *relatedness* across treatment groups.

Change talk (CT)	ICC (95% CI)		GMI		TCC		<i>t</i>	<i>p</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Desire	.99 (.99–1.0)	8.67	10.21	.13	.35	2.06	.03	1.22	
Ability	.99 (.97–.99)	8.33	8.77	1.75	1.58	1.93	.05	1.07	
Reasons	.97 (.84–.99)	23.89	21.29	3.25	4.16	2.62	.02	1.39	
Need	.87 (.44–.98)	8.00	6.56	1.50	1.69	2.71	.02	1.40	
Taking steps	.93 (.63–.99)	4.56	3.71	1.88	2.03	1.71	.09	.93	
Commitment	.95 (.73–.99)	3.11	3.72	.88	1.64	1.56	.14	.80	
Total CT	.99 (.96–.99)	56.11	48.93	9.31	6.92	2.54	.02	1.38	
<i>Relatedness</i>	.99 (.92–.99)	28.56	12.99	16.75	7.81	2.47	.04	1.15	

Note: ICC = intra-class correlation; GMI = group motivational interviewing; TCC = treatment control condition. Means correspond to frequency of each type of CT per group session.

Table 4

Differences in CT strength ('extensiveness') between GMI and TCC.

	GMI <i>M (SD)</i>	TCC <i>M (SD)</i>	<i>t</i>	<i>d</i>
Desire strength	4.33 (2.49)	1.38 (.74)	3.27**	1.66
Ability strength	4.78 (2.28)	2.38 (1.68)	2.44*	1.26
Reason strength	6.33 (.86)	3.13 (2.53)	3.58**	1.85
Need strength	4.78 (2.33)	2.38 (2.06)	2.23*	1.15
Taking steps strength	4.22 (2.22)	2.13 (1.55)	2.22*	1.14
Commitment strength	3.78 (2.22)	1.13 (.35)	3.32**	1.72

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

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Table 5

Bivariate correlations between CT, *relatedness*, and therapist skills.

	1	2	3	4	5	6	7	8	9	10	11
1. Desire	-	.85***	.92***	.86***	.46	.67***	.95***	.07	.76***	-.25	.62*
2. Ability		-	.80***	.93***	.69**	.64**	.92***	.02	.56*	-.15	.50
3. Reason			-	.85***	.38	.75***	.96***	.32	.66**	-.25	.77**
4. Need				-	.69**	.69***	.94***	.13	.68**	-.25	.62*
5. Taking steps					-	.59*	.58*	.01	.49	.14	.38
6. Commitment						-	.78***	.27	.27	-.01	.52*
7. Total CT							-	.19	.70**	-.21	.71**
8. <i>Relatedness</i>								-	.01	-.32	.52*
9. MI adherent									-	-.09	.59*
10. MI non-adherent										-	-.42
11. MI global totals											-

* $p < .05$.

** $p < .01$.

*** $p < .001$.