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Under what conditions? Therapist and client characteristics moderate the role of change talk in brief motivational intervention

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Abstract

Objective: Client change talk has been proposed as a mechanism of change in motivational interviewing (MI) by mediating the link between therapist MI-consistent behaviors (MICO) and client behavioral outcomes. We tested under what circumstances this mechanism was supported in the context of a clinical trial of brief MI for heavy drinking among non-treatment seeking young men.

Methods: We conducted psycholinguistic coding of 174 sessions using the MI Skill Code 2.1 and derived the frequency of MICO and the strength of change talk (CTS) averaged over the session. CTS was examined as a mediator of the relationship between MICO and a drinking composite score measured at 3 month follow-up, controlling for the composite measure at baseline. Finally, we tested therapist gender and MI experience as well as client readiness to change and alcohol problem severity as moderators of this mediation model.

Results: CTS significantly predicted outcome (higher strength related to less drinking), but MICO did not predict CTS. However, CTS mediated the relationship between MICO and drinking outcomes when therapists had more experience in MI and when clients had more severe alcohol problems (i.e. significant conditional indirect effects).

Conclusions: The mechanism hypothesized by MI theory was operative in our brief MI with heavy drinking young men, but only under particular conditions. Our results suggest that attention should be paid to therapist selection, training, and/or supervision until they reach a

certain level of competence, and that MI might not be appropriate for non-treatment seeking clients drinking at a lower level of risk.

Public Health Significance Statement: This study shows that therapists' and clients' characteristics influence the way MI affect clients' behavior change. Indeed, in this sample of 20-year old hazardous male drinkers, the technical model of MI was most operative when clients had high alcohol severity and experienced therapists. On the other hand, when inexperienced therapists intervened with low severity clients, the MI session was counterproductive.

Keywords: Motivational interviewing, change talk, mediation, mechanism.

Introduction

Motivational Interviewing (MI) has been found to be an efficacious intervention for substance abuse behaviors in several meta-analyses (e.g. Lundahl & Burke, 2009; Smedslund et al., 2011). However, not all MI interventions have been found to be efficacious, and the strength of the effect has been small to moderate and variable (Lundahl & Burke, 2009). Variability in effectiveness may be due to many factors, including patient variables, the context for the treatment intervention, the delivery of the MI treatment itself, or any combination of such factors. Miller and Rose (2009) have hypothesized that a primary pathway through which MI works is “the technical hypothesis”. Within this framework, MI consistent behaviors (MICO) increase the client’s amount of change talk (CT, i.e. all client language expressed in favor of a specified behavior change). In-session CT subsequently increases the likelihood of the client changing the targeted behavior (e.g. alcohol consumption) in the favored direction (e.g., a decrease in alcohol consumption). In summary, in order for the technical hypothesis to be supported as a causal chain explaining MI’s effectiveness it is necessary that: 1) MICO be predictive of outcome, 2) MICO be predictive of CT, 3) CT be predictive of outcome, and 4) that the indirect effect of the MICO to CT to outcome linkage at least partially account for the strength of the relationship between MICO and outcome.

Several empirical studies have investigated each separate link of the MI technical causal chain. Some studies have found that MICO is predictive of outcome (Gaume, Gmel, & Daeppen, 2008a; Moyers, Martin, Houck, Christopher, & Tonigan, 2009), while others have not (Pirlott, Kisbu-Sakarya, Defrancesco, Elliot, & Mackinnon, 2012; Tollison et al., 2008; Tollison et al., 2013). Studies have demonstrated a positive association between MICO and CT (Apodaca, Magill, Longabaugh, Jackson, & Monti, 2013; Catley et al., 2006; Gaume, Bertholet, Faouzi,

Gmel, & Daeppen, 2010; Gaume, Gmel, Faouzi, & Daeppen, 2008b; Moyers et al., 2007; Moyers et al., 2009; Pirlott et al., 2012; Vader, Walters, Prabhu, Houck, & Field, 2010). The link between CT and outcome has also been found to be variable, with some studies showing a significant effect for change talk predicting better outcomes (Bertholet, Faouzi, Gmel, Gaume, & Daeppen, 2010; Moyers et al., 2007; Moyers et al., 2009; Pirlott et al., 2012; Vader et al., 2010), while in others, only sub-dimensions of change talk (e.g. commitment to change, ability to change, reasons) had a predictive effect (Amrhein, Miller, Yahne, Palmer, & Fulcher, 2003; Baer et al., 2008; Campbell, Adamson, & Carter, 2010; Gaume, Bertholet, Faouzi, Gmel, & Daeppen, 2013; Gaume et al., 2008a; Hodgins, Ching, & McEwen, 2009).

Only three studies have tested the full technical hypothesis within a mediation framework (Moyers et al., 2009; Pirlott et al., 2012; Vader et al., 2010), and in two of these studies the model was supported (Moyers et al., 2009; Pirlott et al., 2012). In the Moyers and colleagues (2009) study, the authors found that therapist MICO behaviors predicted client CT; that there was a direct link from CT to drinking outcomes and that there was a mediational role for CT between therapist behavior and client drinking outcomes. Even if supportive of the causal chain hypothesized, the magnitude of the mediated effect was small and the results were limited to a short timeframe (i.e. outcomes measured between baseline and 5-weeks) (Moyers et al., 2009). The Vader and colleagues study (2010) examined mediation in two MI conditions, MI including a feedback component and MI without a feedback component. In the examination of MI treatment effects (Walters, Vader, Harris, Field, & Jouriles, 2009), MI plus feedback resulted in superior outcomes to MI alone and the control condition, whereas the MI stand-alone condition was not more effective than the control condition. In parallel, the examination of the MI technical hypothesis revealed that MICO was related to CT in both conditions, but that CT

predicted the 3-month outcome only in the MI plus feedback condition (Vader et al., 2010). Nevertheless, tests of mediation (i.e. indirect effect) were non-significant for both conditions. The inference to be drawn from these parallel findings may be that MI is effective when the technical hypothesis is observed to be active during the treatment, and MI may not be effective when the technical hypothesis is not supported. In their study, Pirlott and colleagues (2012) investigated MI mechanisms within an intervention to promote firefighters' healthy diet and regular exercise. MICO frequency significantly correlated with firefighters' total client change talk utterances, which correlated significantly with their fruit and vegetable intake increase at 1-year follow-up ($r = 0.33$). Mediation analyses demonstrated that total client change talk mediated the relationship between therapist's MICO behaviors and increased fruit and vegetable consumption (Pirlott et al., 2012).

The conclusions to be drawn from this body of research are 1) that the technical hypothesis as to how MI affects outcomes is partially supported across studies, but 2) some of this support is limited, and 3) the factors that affect the strength of MICO's effect on CT and outcome are unknown. Such variables may include patient factors, the context for the intervention, and/or its delivery. The aim of the present study is to examine selected therapist and patient variables that may determine whether CT is operative as a mechanism of change in a brief intervention for a sample of young men volunteering for the study (the context for the MI intervention). We will examine whether therapist and/or participant factors affect the strength of the relationship between MICO and CT, and between CT and outcome. Findings from this research will be instructive in evaluating the conditions under which the MI technical hypothesis may be operative.

Data for the present study were drawn from a randomized controlled trial (*reference removed for masked review*) in which we evaluated the efficacy of a single brief MI session (BMI) against no intervention to reduce heavy drinking among Swiss young men from the general population included during army conscription process. At 3-month follow-up, the BMI group (N=179) showed significantly lower drinking than the control group (N=182) on a composite drinking score that included drinking days per week, drinks per drinking day, and binge drinking frequency, controlling for the baseline drinking value of this variable. This first step showed that there was experimental evidence of an effect of the BMI, and this suggests an underlying mechanism is transmitting this effect.

In the present study, we applied the MI generic conceptualization of CT mediating the link from MICO behaviors to outcome (Miller & Rose, 2009; Moyers et al., 2009) to a particular type of MI intervention (i.e. a single BMI), in a specific population (i.e. young heavy drinkers from the general population not seeking treatment). Our hypotheses were that MICO would be positively related to CT strength, that CT strength would be negatively related to outcome (i.e. higher CT strength predicting less drinking), and that CT strength would partially mediate the link between MICO and outcome. Additionally, we hypothesized that the strength of these effects would be stronger when therapist and young men characteristics were considered (i.e. moderated mediation). Specifically, we hypothesized stronger effects among therapists having more MI experience, as well as among young men having higher readiness to change and more severe alcohol use patterns. We also tested therapist gender for gender matching effect (all clients were males) but without a directional hypothesis.

Methods

Sample and inclusion procedures

Study participants were from a randomized controlled trial of BMI among hazardous drinkers included within the Army Recruitment Center of *Masked for review (reference removed for masked review)*. Switzerland has a mandatory two-day army conscription process for all males at age 19, and virtually all conscripts complete the physical, medical and cognitive assessments to determine eligibility for service in the Swiss military. Women are allowed to join the military service on a voluntary basis but were not included because of their scarcity and resulting non-representativeness. At all research stages, participants were reminded that the research staff had no connection with the army and that all information was confidential. Study procedures were approved by the Ethics Committee for Clinical Research of *Masked for review*.

Inclusion and study procedures are described in detail in an article reporting the results of the randomized controlled trial (*reference removed for masked review*). Briefly, 1023 conscripts were randomly selected to be offered participation. Of those, 192 (18.8%) were not included due to priority army assessment. Of the remaining 831, 194 (23.4%) refused participation (185 due to follow-up procedures and 9 due to audio-recorded BMI). Consenting conscripts then filled out a self-administered assessment questionnaire; the research staff provided assistance if needed. The Alcohol Use Disorders Identification Test–Consumption (AUDIT-C, Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998) was used to screen for hazardous drinking (cut-off of 4 points or more, Reinert & Allen, 2007) and non-hazardous drinkers were excluded (n=196, 30.8%). The remaining participants were randomly allocated to the BMI condition (n=217) or to a control condition with no intervention (n=224). Within the BMI condition, 208 interventions (95.8%) were completely audio-recorded while the remaining 9 had technical problems. Follow-up

procedures took place 3 months after baseline and were conducted by telephone by interviewers blinded to group allocation. Among the 208 young men with audio-recorded BMI, 174 participants (83.6%) were followed-up and thus constitute the sample of the present study.

Intervention and therapists

The experimental condition was a 20 to 30-minute BMI, exploring alcohol use, its related consequences, and upon participant agreement, a change plan discussion. No specific guidelines were provided regarding the content of individual interventions, but all therapists were familiar with the brief intervention format and with MI techniques and principles. Therapists were 9 physicians and 9 psychologists from the *Masked for review*, selected for the parent trial (*reference removed for masked review*) to provide varied backgrounds and a range of clinical (from new residents/psychologists to faculty members) and MI (from beginners to recognized experts) experience. All clinicians, however, received four half-days of MI training when they assumed their positions at the Center.

Young men and therapists questionnaires

Client self-report measures. The assessment questionnaire of the conscripts included basic demographic information such as age, education (coded as 9 years of obligatory school only vs. further education), professional status (coded as employed, in training, or inactive), and living environment (coded as urban vs. rural area). The drinking variables were: usual number of drinking days per week, usual number of drinks (defined as 10 grams of alcohol such as 100 ml of wine, 250 ml of beer or 25 ml of spirits) per drinking day, and frequency of binge drinking episodes (6 drinks or more) over the last year (measured on a 0-4 scale with 0=never, 1=less than

monthly, 2=monthly, 3=weekly, and 4=almost daily). Additional self-report measures were: the Alcohol Use Disorder Identification Test (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001); the University of Rhode Island Change Assessment Scale - DELTA Project Reduced Drinking Version (Soderstrom et al., 2007). Measures were the same for the 3-month follow-up as at baseline except that they were framed within a 3-month window instead of 12-month. To be consistent with the parent trial report (*reference removed for masked review*), we used the same outcome measure, which was a drinking composite score computed from the mean of the z scores for usual drinking days per week, usual drinks per drinking day, and frequency of binge drinking (used as the continuous scale from 0 to 4, see above).

Therapist self-report measures. The therapists filled out a short baseline questionnaire assessing their age, gender, and professional background (psychologist vs. physician), as well as their number of years of 1) clinical experience and 2) experience in MI. In addition, 2 questions addressed their views of BMI (i.e. viewing themselves as effective when conducting BMI, and thinking that BMI might help reduce alcohol use) using 10-point Likert scales.

Observational coding methods

Therapists and young men behaviors within the BMI sessions were coded using the Motivational Interviewing Skill Code (MISC), version 2.1 (Miller, Moyers, Ernst, & Amrhein, 2008). Coding procedure involved two passes through each session. The first, uninterrupted pass assessed global ratings, which were not used in the present study. During the second, the coder categorized each therapist and patient utterance using one of the proposed MISC codes. Audio-recordings were exported to Dartfish Team Pro 4.0 analysis software (Dartfish, 2006). Recorded utterances were parsed by one coder and coded by another.

MISC codes are comprised of 19 therapist and 8 client codes. In the present study, the codes were reduced to two therapist and one client categories. Therapist behaviors were summarized into: 1) MI-consistent behaviors (MICO), recommended in the MI literature (advise with permission, affirm, emphasize control, open question, simple and complex reflections, reframe, and support); and 2) MI-inconsistent behaviors (MIIN) not recommended (advise without permission, confront, direct, raise concern without permission, and warn).

Regarding young men's speech, there are globally two ways of measuring CT in the MI process literature: frequency (i.e. the count of each CT utterance per session) and averaged strength of CT (i.e. the mean of the strength ratings attributed to each utterance on a given scale from strongly against change to strongly toward change; Amrhein et al. 2003). In the present study, we used CT strength since it has been shown to better predict outcomes in a recent meta-analysis of the MI technical hypothesis (Magill et al., 2014) and in a similar population (Gaume et al., 2013). To do so, we summed the strength rating attributed for each CT utterance on a scale from -3 (strong inclination away from change/toward the status quo) to +3 (strong inclination toward change) and divided this sum by the total frequency of CT utterances (Ability or inability to change, Commitment to change or not to change; Desire to change or not to change, Need to change or lack of need for change or a need not to change, Reasons to change or reasons not to change, and Taking Steps toward or away from change).

Four master-level students were trained in using the MISC 2.1 by the first author and then independently parsed and coded interventions while blinded to assessment and follow-up data. One additional person did only parsing. Training consisted of 1) a short presentation on MI and the MISC, 2) detailed reading of the MISC manual, 3) independent, then group coding of training MI sessions pre-coded by the trainers, 4) quizzes and 5) independent, then group coding

of BMI from another study. Throughout this training an incremental learning approach was used, starting with simple codes and building up to more complex ones. Each coder received about 60 total hours of training. Further, discrepancies and challenges were addressed weekly in joint trainer-coder meetings, which lasted throughout the entire data collection period.

A random subsample of 42 BMI sessions (20.2%) was double-coded to assess inter-rater reliability. Coders were blinded to whether the session they rated was single- or double-coded. Coding reserved for analyses was randomly selected from each available double-coded BMI. Since independent raters did parsing a priori, double coding could be done on the same utterances. Cohen's kappa was used to address inter-rater reliability at the utterance level (i.e. pooling all sessions together). When using all codes, Kappa was 0.87 indicating *almost perfect agreement* according to Landis and Koch (1977). When summarizing codes in 6 categories (MICO, MIIN, and other therapist behaviors; positive CT [+1 to +3], negative CT [or sustain talk, -1 to -3], and other, neutral young men behaviors), Kappa was 0.90 confirming *almost perfect agreement*. As proposed by Amrhein and colleagues (2003) and optionally prescribed in the MISC 2.1 (Miller et al. 2008), instances of positive and negative CT were additionally attributed a strength rating thus allowing computation of utterance level Kappa for CT strength; this was 0.76, and linearly weighted kappa (a measure for ordinal variables which assigns less weight to agreement as categories become further apart) was 0.87, also indicating *substantial to almost perfect agreement* according to Landis and Koch (1977). Inter-rater reliability for each individual code at the session level was assessed using intra-class correlations (ICCs) and interpreted according to the categorization by Cicchetti (1994). Agreement was *good to excellent* for all individual codes (ICCs ranging from .66 to .99) and *excellent* for summary codes retained

in the present analyses (MICO: 0.99, CT strength: 0.92). Agreement tabulations for strength as well as valence ratings are available upon request from the first author.

Statistical analysis

As a first step, we used classical descriptive statistics to characterize our therapist and young male samples. We then used mediation and moderated mediation analyses to test our hypotheses.

Mediation. Mediation analyses (Baron & Kenny, 1986) posit how, or by what means, an independent variable (X) affects a dependent variable (Y) through one or more potential intervening variables, or mediators (M). Several paths are tested using regression analyses (see Figure 1). Path *a* represents the effect of X on the proposed mediator, whereas path *b* is the effect of M on Y partialling out the effect of X. The indirect effect of X on Y through M can then be quantified as the product of the *a* and *b* paths (i.e. ab , Sobel, 1982). The total effect of X on Y is quantified with the unstandardized regression weight *c*. The total effect of X on Y can be expressed as the sum of the direct and indirect effects: $c = c' + ab$. Bootstrapping, a nonparametric resampling procedure, is an additional method advocated for testing mediation that does not impose the assumption of normality of the sampling distribution (Hayes, 2013; Preacher & Hayes, 2008). Specifically, it is a computationally intensive method that involves repeatedly sampling from the data set and estimating the indirect effect in each resampled data set. By repeating this process thousands of times (5000 in the present analyses), an empirical approximation of the sampling distribution of ab is built and used to construct confidence intervals for the test of the indirect effect (Preacher & Hayes, 2008). We used this approach as implemented in Model 4 of the PROCESS macro for SPSS (Hayes, 2013). Here, therapist frequency of MICO was used as the independent variable (X), the drinking composite score at 3-

month follow-up as outcome variable (Y), and CT strength as the mediator (M) (see Figure 1). All models were adjusted for the drinking composite score at baseline.

Moderated mediation. It is often of critical interest to determine whether or not a mediation effect remains constant across different contexts or groups of individuals. For example, perhaps M mediates the $X \rightarrow Y$ relationship among experienced therapists but not among inexperienced therapists. More generally, the strength of an indirect effect may depend linearly upon the value of a categorical or continuous moderator (W) (Preacher, Rucker, & Hayes, 2007). We used Model 7 of the PROCESS macro for SPSS (Hayes, 2013) to conduct tests of conditional indirect effects when assessing mediation as moderated by therapists' characteristics (i.e., therapist gender and MI experience). Model 7 specifies that the moderator influences only the *a* path of the mediated relationship, or in the current case, the relationship between MICO and CT strength. We expanded model 7, however, to Model 58 of the PROCESS macro for SPSS (Hayes, 2013) to conduct tests of conditional indirect effects when assessing mediation as moderated by young men characteristics (i.e., baseline readiness to change and severe alcohol use patterns according to the AUDIT). Model 58 specifies that the moderator influences both the *a* and *b* paths, i.e. the link between MICO and CT strength, and the link between CT strength and the outcome in the present analysis. All moderated mediation models controlled for the baseline drinking composite score and for the other moderator variables. As a final step, we generated a single model combining significant moderators to test for synergistic effects.

Interaction plots. In the presence of interaction effects, we used the “/plot” subcommand for Model 1 implemented in the PROCESS macro for SPSS (Hayes, 2013). This subcommand generates a table of predicted values for the dependent variable at specified values of the

independent variable (set here as 5 values: the 10th, 25th, 50th, 75th, and 90th percentiles). The covariates in the model were set to their sample means when deriving the predicted values.

Therapist and young men characteristics that were measured as continuous variables were dichotomized to serve as moderators. This was done to facilitate data interpretation. Dichotomization was done using the median as a cut-off to provide sub-groups of balanced sizes. To test the linearity of conditional indirect effects observed with our dichotomized variables, we ran again the same analyses with the continuous moderator variables tested at their 10th, 25th, 50th, 75th, and 90th percentiles (see Hayes, 2013).

Results

Baseline characteristics and within-session behaviors descriptive statistics

At baseline (Table 1), the young men included in this analysis on average drank a bit more than 2 days per week and about 5 drinks per drinking day. About one third had binge drinking episodes monthly and one third weekly. According to the Alcohol Use Disorder Identification Test, severity of alcohol use patterns was in the mid-range on average, between hazardous drinking (score of 8, Babor et al., 2001) and probable dependence (score of 12, Gache et al., 2005). Readiness to change was low, with the mean and quartiles indicating these young men were mostly at the pre-contemplation level.

Insert Table 1 here.

Therapists were 10 females and 8 males (Table 1). Experience with MI was 3.8 years on average, with a range between 0 months (included right after MI training) and 14 years, and the 25th, 50th, and 75th percentile being 0, 3, and 6 years. On average, therapists did about 50 MICO behaviors per session, but there was wide variability (SD=25.1). For the young men, mean CT strength was -0.3 (SD=0.4), indicating an overall slight inclination to maintain the status quo in drinking behavior.

Mediation model

Our mediation model is pictured in Figure 1. CT strength significantly predicted outcome such that higher CT strength related to less drinking at follow-up ($B = -0.26, p = 0.02$). MICO did not significantly predict CT strength ($B = 0.001, p = 0.34$). Subsequently, no mediation was observed (i.e. a non-significant indirect effect).

Insert Figure 1 here.

Moderated mediation

When therapists and young men moderating characteristics were examined (Table 2), results highlighted the importance of therapist MI experience and young men alcohol severity. Specifically, CT strength mediated the relationship between MICO and drinking outcomes (i.e. more MICO related to higher CT strength which related to less drinking) when therapists had more experience in MI (3 or more years); conditional indirect effect = $-.0010$, standard error (SE) = $.0007$, 95% bootstrapped confidence interval (CI): $-.0029$ to $-.0001$; OLS coefficient for interaction effect on the a path: $B = .0054, SE = .0026, p = 0.04$. This moderation of the a path of

the MI technical model is pictured in Figure 2. We also observed a near significant conditional indirect effect when considering young men with higher alcohol use patterns severity (score higher than median, i.e. 9 or more); conditional indirect effect=-.0009, SE=.0007; 95% CI:-.0029 to .0000. OLS coefficients for interaction effects on the *a* and *b* paths showed that the effect was mainly moderated on the *a* path (which is pictured in Figure 2); OLS coefficient for interaction effect on the *a* path: B=.0045, SE=.0027, p=0.09; OLS coefficient for interaction effect on the *b* path: B=-.2853, SE=.2474, p=0.25).

Insert Table 2 and Figure 2 here.

As a final step, we conducted a model combining therapist experience and alcohol problem severity as moderators on the *a* path (model 9 in Hayes, 2013); moderation of alcohol problem severity on the *b* path was not retained as the interaction was not significant in the model above. Synergistic effects of the two moderators were observed (Table 2 and Figure 2). The conditional indirect effect was significant when therapists with higher MI experience met with young men with higher severity. In contrast, the conditional indirect effect was in the opposite direction (i.e. more MICO related to lower CT strength which was related to more drinking) when therapists with less experience met with young men with low severity.

To test the linearity of conditional indirect effects observed with our dichotomized variables, we ran again the same analyses with the continuous moderator variables at their 10th, 25th, 50th, 75th, and 90th percentiles (see Hayes, 2013). All results were in the same direction, with a

gradient observed across the conditional indirect effects at the 5 levels tested (data not presented but available upon request).

Discussion

Findings indicate that the mechanism of change hypothesized by MI theory, strength of change talk (Miller & Rose, 2009), was operative in our brief MI (mean=19, SD=5 minutes) with heavy drinking non-treatment seeking young men only under particular conditions. Together with the study by Moyers et al. (2009) and Pirlott et al. (2012), this partial validation of MI hypothesized mechanisms adds further empirical support for the importance of change talk in MI and for the use of skills recommended in MI theory to enhance this client behavior.

Our findings also provide several caveats regarding MI dissemination. First, attention should be paid to therapist selection and/or training and supervision until they reach a certain level of MI competency. In this particular setting and with this particular population, more MICO was related to lower strength of change talk and to increases in drinking when less experienced therapists met with young men with lower severity. This suggests potential iatrogenic effects of MI skills under specific circumstances, an effect that has been observed in other research with inexperienced MI therapists (Tollison et al., 2008; Tollison et al., 2013). Specifically, higher peer provider frequency of both open questions and simple reflections were associated with increases in drinking quantity over five and 10-month follow-ups (Tollison et al., 2013). In these authors' previous work, the proportion of complex reflections attenuated the contraindicated effect of simple reflections in relation to student alcohol outcomes (Tollison et al., 2008). Such potential iatrogenic effects should be further studied since MI is already widely disseminated with delivery offered by a range of provider types.

In contrast, we observed the proposed mechanism of change of MI among therapists experienced in this approach (3 years or more). Among these, more MICO were related to higher CT strength which was related to better alcohol use outcomes, and the conditional indirect effect was significant. This finding is consistent with the position that MI is an approach that requires ongoing practice experience to demonstrate the level of skill needed for intervention efficacy (Miller & Mount, 2001). To our knowledge, counselor experience in MI had never been investigated before. However, substance abuse and psychotherapy literature has addressed this topic and yielded conflicting results. Some studies and reviews found no relationship between client outcomes and general clinical experience or experience in specific therapies (Beutler et al., 2004; Blatt, Sanislow, Zuroff, & Pilkonis, 1996; Miller, Taylor, & West, 1980; Najavits, Crits-Christoph, & Dierberger, 2000) while others found significant relationship between therapist experience and outcome (Crits-Christoph, Baranackie, Kurcias, & Beck, 1991; Huppert et al., 2001; Roos & Werbart, 2013; Sanchez-Craig, Spivak, & Davila, 1991; Stein & Lambert, 1995). In their recent discussion on expertise in psychotherapy, Tracey, Wampold, Lichtenberg, and Goodyear (2014) concluded that the more effective therapists did not appear to be the most experienced therapists but those who were able to form working alliances across a range of clients (Baldwin, Wampold, & Imel, 2007) and who had a greater level of facilitative skills (Anderson, Ogles, Patterson, Lambert, & Vermeersch, 2009). It is of interest that these particular competences are close to MI principles (Miller & Rollnick, 2013), thus maybe suggesting that the effect of experience observed here might be a proxy of these dimensions. This underscores the importance of evaluating the underlying patterns within these relationships in further research.

Our findings suggest that MI might not be appropriate for non-treatment seeking clients drinking at lower levels of risk. Indeed, MI skills did produce the expected effect only among young men showing more severe alcohol problems. The role of problem severity in subsequent client outcomes has been considered in the literature. A meta-analysis showed that BMI effects were higher among heavy or low dependent drinkers (Vasilaki, Hosier, & Cox, 2006). In a study among the same population as the present study, our group showed that the presence of consequences of alcohol use enhanced BMI efficacy (*reference removed for masked review*). Further, a study conducted in an Emergency Department showed that patients with higher alcohol consumption benefited more from BMI (Blow et al., 2009). In both these studies, the authors concluded that the presence of more severe alcohol use patterns may help develop a discrepancy between the individual's current behavior and their future and desired goals, hence leading to behavior change. This resolution of discrepancy is a core feature of MI (Miller & Rollnick, 2013) and has been empirically observed to be related to change in alcohol use (McNally, Palfai, & Kahler, 2005). The present results showed that MI behaviors produced the expected effects only among heavier drinkers, thus maybe when some discrepancy was effectively to be resolved. On the other hand, alternative prevention measures, or at least a very seasoned therapist, might be needed for heavy drinkers drinking at lower levels of risk (i.e., just over threshold limits) who are not seeking treatment.

To put these findings in broader context, meta-analyses of MI have provided solid evidence for its efficacy across a wide range of populations and targeted behaviors. This support has been an impetus for ever broader application across populations, target behaviors and treatment contexts. Studies on how MI works have become a priority for research. A meta-analysis of Miller and Rose's (2009) technical hypothesis has recently been completed, with results

supportive of the MICO to CT and strength of change talk to outcome linkages (Magill et al., 2014). In aggregate, this body of research is impressive, suggesting MI's wide application. However, as with any treatment the limits of the generalizability of its effectiveness must be identified. MI will not be effective in all populations, across all target behaviors, or in all contexts for intervention. Use of this brief MI for this non-treatment seeking cohort of 20 year old men was found to be more effective than no intervention (*reference removed for masked review*). However the overall effect was quite modest, suggesting that the intervention was efficacious only for some of the participants. The present study sought to identify how this effectiveness was achieved by testing the MI technical hypothesis that MICO would be associated with strength of change talk which would be predictive of better outcome. The hypothesized causal chain was supported only for those young men who had higher alcohol severity when they were treated by more experienced therapists. Even highly experienced therapists could not be effective with 20 year old pre-contemplative men who had low alcohol severity (although the skill to language relationship was in the predicted, positive direction). With inexperienced MI therapists treating low alcohol severity men the intervention was likely to be misguided at best and perhaps even counter-productive.

Despite the strengths of this study such as a large sample size (for such kind of analyses), the number of therapists and their wide range of MI experience, and the high reliability of the psycholinguistic coding, some limitations should be noted. First, generalizability of our findings is limited to young male populations with similar patterns of alcohol use, and to short, single brief MI sessions. Second, the direct effect from MICO to alcohol use outcome was not significant. Following the first definitions of mediation analyses (Baron & Kenny, 1986), mediation should not be tested if there are no significant direct effect to mediate. Yet, this

requirement has been abandoned by several mediational analysts (e.g. Hayes, 2009; Mackinnon, 2008; Rucker, Preacher, Tormala, & Petty, 2011; Shrout & Bolger, 2002). According to these authors, sample size, lower strength of relationship, or suppression effects can dissimulate the direct effect. In our study, the presence of disordinal conditional indirect effects might suggest a suppression, or canceling, of the direct effect (i.e. MICO produced higher CT strength and better outcomes in a sub-sample, but lower CT strength and poorer outcomes in another sub-sample). Third, therapist and young men utterances were summarized across the session thus involving a temporal limitation. Indeed, data analysis is correlational in nature and thus do not guarantee a causal relationship. This temporal feature should be investigated in future analyses in order to confirm the present findings (e.g. at the utterance level or by dividing sessions in smaller intervals).

In aggregate, these findings suggest that both characteristics of the client and therapist need to be considered conjointly when trying to understand *how* and *under which circumstances* the effects of MI might occur. In the present work, the technical model of MI was most operative when pre-contemplative clients had high alcohol severity and experienced therapists. When severity was low, the skills of an experienced therapist were insufficient for producing attitudinal change in our brief MI format, and when low severity clients were paired with inexperienced therapists, the MI session was counterproductive. Findings such as these can add vital information regarding how to: refine current MI theory, identify key priorities for therapist training, and set assessment criteria for therapist and patient selection and matching.

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Table 1. Therapists and young men baseline characteristics and within-session behaviors

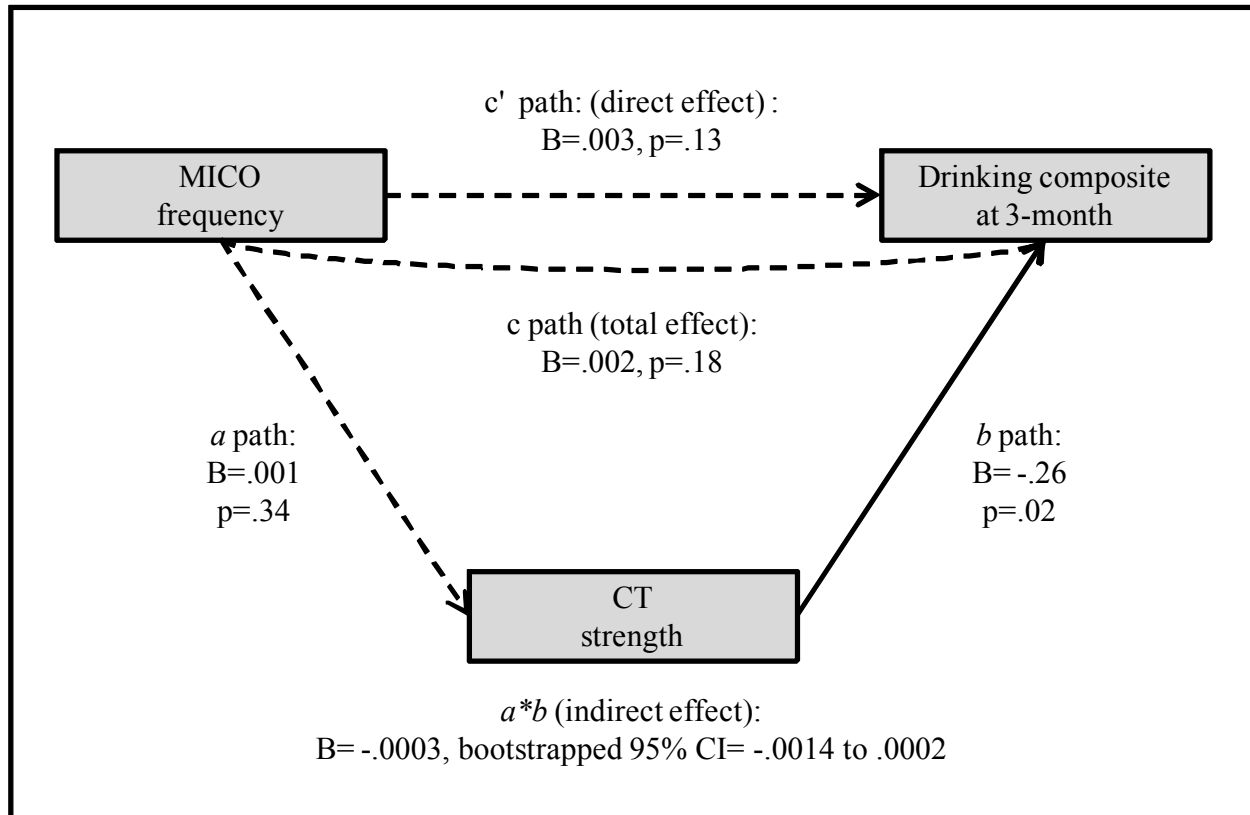
	Mean N	SD %	Min	25 th / 50 th / 75 th percentile	Max
Young men baseline characteristics (N=174)					
Age ^a	19.9	1.1	18.1	19.2 / 19.7 / 20.3	25.3
Education: > 12-year obligatory school ^b	91	52.3%			
Professional status: ^b					
in training	110	63.2%			
employed	49	28.2%			
inactive	15	8.6%			
Living environment : urban ^b	78	44.8%			
Usual drinking days per week ^a	2.3	1.6	.2	1 / 2 / 3	7
Usual drinks per drinking day ^a	4.9	4.6	1	2.75 / 4 / 5	45
Binge drinking frequency: ^b					
never	1	0.6%			
less than monthly	58	33.3%			
monthly	57	32.8%			
weekly	58	33.3%			
AUDIT score [0-40] ^a	10	4.1	4	7 / 9.5 / 13	28
Readiness to change [-5 to +15] ^a	1.6	2.6	-2	-.7 / 1.3 / 3.3	9
Therapists baseline characteristics (N=18)					
Gender: Women ^b	10	55.6%			
Experience in MI (years) ^a	3.8	4.1	0	0 / 3 / 6	14
Therapists and young men within-session behaviors (N=174)					
MICO frequency ^a	48.9	24.8	13	29 / 44.5 / 62	133
CT strength [-3 to +3 scale] ^a	-0.3	0.4	-1.2	-.6 / -.3 / -.1	1.5

^a Continuous variable: descriptive statistics are mean, standard deviation (SD), minimum, quartiles, and maximum.

^b Categorical variable: descriptive statistics are frequency and percent.

AUDIT: Alcohol Use Disorders Identification Test, MICO: MI-consistent behaviors, CT: Change talk.

Figure 1. Mediation model



Solid lines indicate statistically significant links. All models adjusted for Drinking composite at baseline.

SE: Standard error, CI: Confidence interval, MICO: MI-consistent behaviors, CT: Change talk.

N=174.

Table 2. Conditional indirect effects of MICO on Outcome at values of the moderators

Moderators	Values	Effect	Bootstrapped		
			SE	95% CI	
Therapists gender ^a	Male	-0.0001	0.0007	-0.0013	0.0014
	Female	-0.0005	0.0005	-0.0020	0.0001
Therapists MI experience ^a	Low (0 to 2 years)	0.0004	0.0005	-0.0003	0.0019
	High (3+ years)	-0.0010	0.0007	-0.0029	-0.0001
Young men readiness to change [-5 to 15 scale] ^b	Low (-5 to 1.3)	-0.0003	0.0006	-0.0021	0.0007
	High (1.3+)	-0.0004	0.0005	-0.0021	0.0002
Young men alcohol problems severity (based on AUDIT score) ^b	Low (<9)	0.0001	0.0005	-0.0005	0.0016
	High (9+)	-0.0009	0.0007	-0.0029	0.0000
Therapists MI experience and young men alcohol use pattern severity ^c	Low experience Low severity	0.0009	0.0007	0.0000	0.0029
	Low experience High severity	0.0000	0.0006	-0.0013	0.0014
	High experience Low severity	-0.0003	0.0007	-0.0019	0.0010
	High experience High severity	-0.0011	0.0008	-0.0032	-0.0001

MICO: MI-consistent behaviors, SE: standard error, CI: confidence interval, AUDIT: Alcohol Use Disorders Identification Test.

^a Moderated mediation with one moderator on the a path (model 7 in Hayes, 2013)

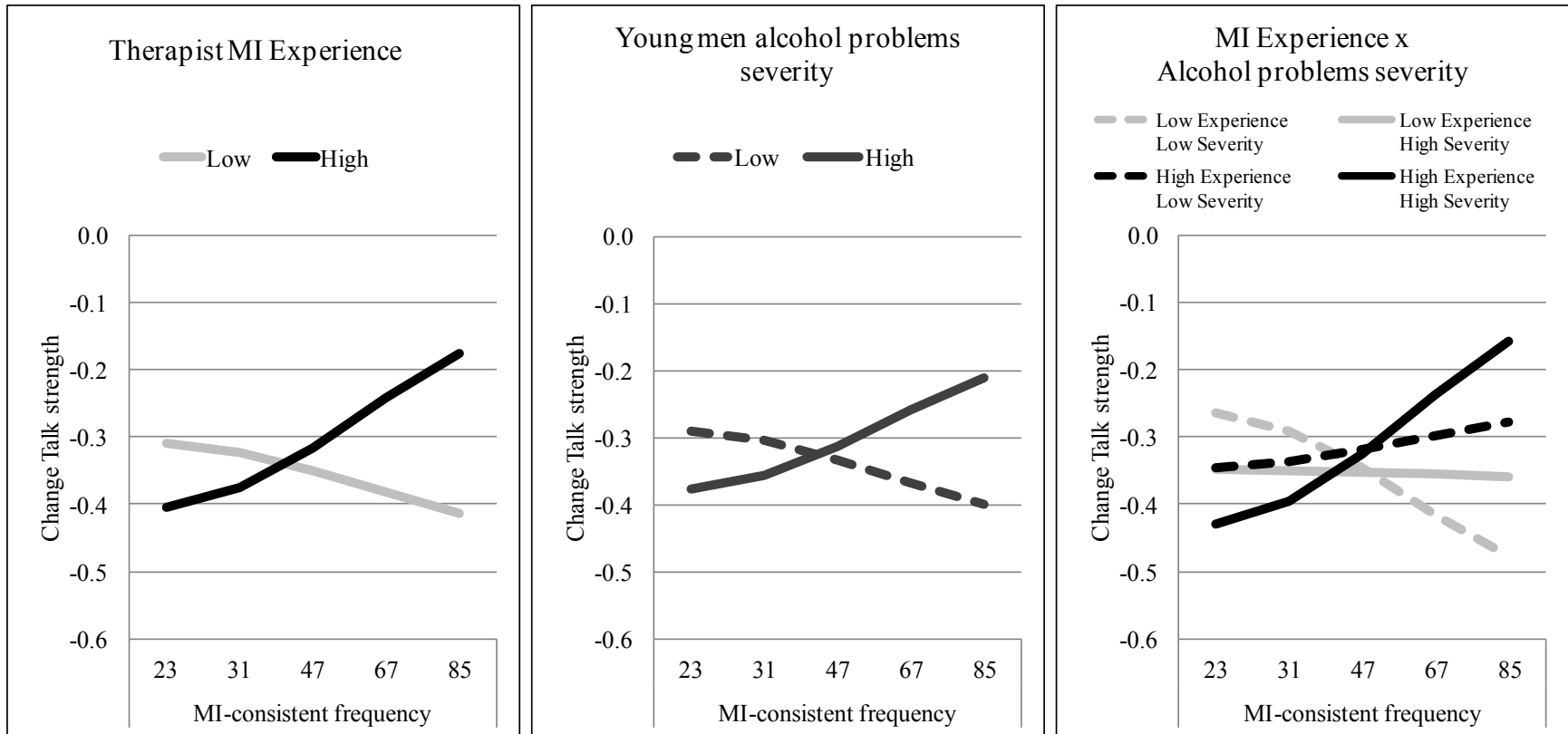
^b Moderated mediation with one moderator on the a and b paths (model 58 in Hayes, 2013)

^c Moderated mediation with two moderators on the a path (model 9 in Hayes, 2013)

All models controlled for baseline drinking composite score and the other moderators.

N=174.

Figure 2. Moderation on the *a* path



Predicted values for Change talk strength at the 10th (23), 25th (31), 50th (47), 75th (67), and 90th (85) percentiles of the independent variable (MI-consistent behaviors frequency). The covariates in the model were set to their sample means when deriving the predicted values.