Title

SUSTAIN TALK PREDICTS WORSE OUTCOMES AMONG MANDATED COLLEGE STUDENT DRINKERS RECEIVING A BRIEF MOTIVATIONAL INTERVENTION

Authors

Apodaca, TR
Borsari, BE
Barnett, NP
et al.

Publication Date

2012

Peer reviewed

Published in final edited form as:
Psychol Addict Behav. 2014 September ; 28(3): 631–638. doi:10.1037/a0037296.

Sustain Talk Predicts Poorer Outcomes among Mandated College Student Drinkers Receiving a Brief Motivational Intervention

Timothy R. Apodaca[1], **Brian Borsari**[2,3], **Kristina M. Jackson**[3], **Molly Magill**[3], **Richard Longabaugh**[3], **Nadine R. Mastroleo**[3], and **Nancy P. Barnett**[3]

[1]Children's Mercy Kansas City

[2]Department of Veterans Affairs Medical Center

[3]Center for Alcohol and Addiction Studies, Brown University

Abstract

Within-session client language that represents a movement toward behavior change (change talk) has been linked to better treatment outcomes in the literature on motivational interviewing (MI). There has been somewhat less study of the impact of client language against change (sustain talk) on outcomes following an MI session. This study examined the role of both client change talk and sustain talk, as well as therapist language, occurring during a brief motivational intervention (BMI) session with college students who had violated college alcohol policy ($N = 92$). Audiotapes of these sessions were coded using a therapy process coding system. A series of hierarchical regressions were used to examine the relationships among therapist MI-consistent and MI-inconsistent language, client change talk and sustain talk, as well as global measures of relational variables, and drinking outcomes. Contrary to prior research, sustain talk, but not change talk, predicted poorer alcohol use outcomes following the BMI at 3- and 12-month follow-up assessments. Higher levels of client self-exploration during the session also predicted improved drinking outcomes. Therapist measures of MI-consistent and MI-inconsistent language, and global measures of therapist acceptance and MI spirit were unrelated to client drinking outcomes. Results suggest that client sustain talk and self-exploration during the session play an important role in determining drinking outcomes among mandated college students receiving a BMI addressing alcohol use.

Correspondence concerning this article should be addressed to Timothy Apodaca, Department of Pediatrics, University of Missouri-Kansas City School of Medicine, Children's Mercy Hospital, 2401 Gillham Rd., Kansas City, Missouri, 64108. trapodaca@chm.edu.

Timothy R. Apodaca, Department of Pediatrics, University of Missouri-Kansas City School of Medicine; Brian Borsari, Mental Health and Behavioral Sciences Service, Department of Veterans Affairs Medical Center, and Department of Behavioral and Social Sciences, Center for Alcohol and Addiction Studies, Brown University; Richard Longabaugh, Department of Psychiatry and Human Behavior and Center for Alcohol and Addiction Studies, Brown University; Kristina M. Jackson, Molly Magill, Nadine R. Mastroleo and Nancy P. Barnett, Department of Behavioral and Social Sciences, Center for Alcohol and Addiction Studies, Brown University.

Portions of this manuscript were presented at the 2012 Third Annual International Conference on Motivational Interviewing, Venice, Italy, and the 2012 annual conference of the Research Society on Alcoholism, San Francisco, CA.

Keywords

Motivational Interviewing; therapy process; alcohol use; brief intervention; change language; mandated students

Heavy drinking peaks during late adolescence and early adulthood and is especially common among young adults who attend college (Hingson, Heeren, Winter, & Wechsler, 2005). Tens of thousands of college students violate campus alcohol policy per year for issues such as possession of alcohol, behavioral problems while intoxicated, and alcohol-related medical complications (Porter, 2006). Colleges often require these students to complete an alcohol intervention to reduce the likelihood of future heavy drinking episodes (Wechsler et al., 2002). One common intervention provided to mandated college students is Brief Motivational Intervention (BMI), which incorporates motivational interviewing (MI), and commonly includes personalized feedback along with other MI components designed to motivate behavior change.

Individual BMIs (typically delivered in one or two sessions) have generally been found to be more effective at reducing alcohol use in college students than a variety of less intensive interventions such as alcohol education and normative education (see Carey, Scott-Sheldon, Carey, & DeMartini, 2007; Cronce & Larimer, 2011; Larimer & Cronce, 2007). For example, Borsari and Carey (2005) compared a BMI to individual alcohol education among mandated students. BMI participants showed a significantly greater reduction in alcohol problems at 3- and 6-month follow-up. However, other studies have found more equivocal results. For example, White and colleagues (2006) found no differences in consumption or alcohol problems comparing a BMI vs. a written feedback report (with no counselor contact) at 3-month follow-up. Similarly, a pilot study implementing BMI in a stepped care framework found no differences between BMI and assessment only control at a 6-week follow-up (Borsari, O'Leary-Tevyaw, Barnett, Kahler, & Monti, 2007). However, a recent large-scale study of the same intervention framework (stepped care) found BMI participants to report significantly fewer alcohol-related problems than assessment-only participants at a 9-month follow-up (Borsari et al., 2012). In sum, recent evidence indicates that counselor-delivered interventions may be effective with mandated students, but findings vary across studies and at different follow-up points. There is a need to understand *how* these interventions facilitate change in students who receive them, because such understanding can lead to refinements and improvements in future BMIs.

Mechanisms of Behavior Change in BMIs

Mechanisms of behavior change are defined as processes or events that lead to therapeutic improvement (Kazdin & Nock, 2003). To date, efforts to identify mechanisms of behavior change in BMIs among college students have been primarily focused on (self-reported) mediators of treatment effects (e.g., Borsari & Carey, 2000; McNally, Palfai, & Kahler, 2005). While this research has been useful, there is also a need for greater understanding of how within-session processes contribute to reductions in alcohol use and problems in order to further refine and improve BMI treatment.

A theory of MI has been proposed that emphasizes two components: a *relational* component focused on therapist and client global factors (such as empathy, acceptance, self-exploration), and a *technical* component involving specific therapist behaviors to elicit client change language (Miller & Rose, 2009). There is a growing body of literature on the technical components, focusing on therapist and client behaviors within MI sessions and how these processes link to outcomes. A number of studies have examined client language defined as either *change talk* or *sustain talk*. Miller and Rollnick define change talk as "any self-expressed language that is an argument for change." (2013, p. 159) and sustain talk as "the person's own arguments for *not* changing, for sustaining the status quo." (2013, p. 7). An influential study by Amrhein and colleagues (2003) found that an increase in the strength of change talk over the course of an MI session predicted reduced client substance use at 12-month follow-up. However, because the strength of change talk was created by averaging change talk and sustain talk, the relative contribution of each construct was not ascertainable from this study. A study by Moyers and colleagues (2007) examined the relationship of both client change talk and sustain talk to drinking outcomes across three different treatment modalities (Motivational Enhancement Therapy, Cognitive Behavioral Therapy, and Twelve Step Facilitation). Both change talk and sustain talk uniquely predicted drinks per drinking day (one of the two outcomes measured), while only sustain talk predicted a lower percent of days abstinent. The sample was then split into positive outcomes and poor outcomes. Analyses revealed both change talk and sustain talk each significantly predicted outcomes, highlighting the importance of both types of within-session client language in predicting later alcohol use.

A recent study examined the role of client language within BMIs with heavy drinking college students (Vader, Walters, Prabhu, Houck, & Field, 2010), using audiotapes from a previous study in which MI with personalized feedback was found to significantly reduce drinking outcomes more than MI without feedback (Walters et al. 2009). Findings indicated that in the MI-with-feedback group, therapist MI-consistent language was associated with greater levels of both student change talk and sustain talk, and each was predictive of 3 month drinking outcome in the expected directions. In contrast, in the MI without feedback condition, while MI-consistent language was again found to be associated with both greater change and sustain talk, change talk was unrelated to drinking outcome, while sustain talk was directionally but not significantly related ($p = .058$) to poorer drinking outcome. Tollison and colleagues (2013) have examined the role of specific therapist behavior directly on outcomes among college students receiving a BMI, and found that certain microskills (e.g., open questions, simple reflections) are associated with poorer outcomes such as increased drinking. Hence, the role of therapist and client speech behavior within the BMI are emerging as an important aspect of understanding mechanisms of behavior change in BMIs.

In addition to these *technical* aspects (specific behaviors) of motivational interviewing, *relational* aspects (global approach) are important in the change process (Miller & Rose, 2009). These relational factors include global measures such as therapist empathy, MI spirit, and acceptance, as well as client measures such as therapeutic engagement. Moyers, Miller, and Hendrickson (2005) reported measures of clinician global approach (e.g., acceptance, empathy, MI spirit) correlated significantly with measures of client involvement (e.g.,

collaboration, disclosure, disclosure of affect) during the session. These relational aspects also have been found to predict substance use outcomes. Therapist MI spirit has been shown to predict less frequent marijuana use at a 3-month follow-up (McCambridge et al., 2011), and therapist empathy has been associated with lower levels of drinking at a 12-month follow-up (Gaume, Gmel, Faouzi, & Daeppen, 2008). Finally, Baer and colleagues (2008) reported global client "task orientation" (how much the client remained focused and engaged during therapeutic tasks) predicted more days abstinent at a 3-month follow-up. In sum, relational as well as technical components of motivational interviewing have shown to be important in understanding the change process.

Current Study

The current study is an analysis of therapist and client language from audiotapes of BMI sessions from a completed randomized controlled trial of mandated students who received either BMI or computer-delivered intervention (Barnett, Murphy, Colby, & Monti, 2007). Our primary objective was to investigate the relationship between therapist and client language within the BMI condition of the larger study and student alcohol use and consequences. We hypothesized that client change talk would be negatively associated with subsequent alcohol use and problems, and that client sustain talk would be positively associated with subsequent alcohol use and problems measured at several time-points after treatment. We also examined the relationship of therapist MI-consistent and MI-inconsistent language and global aspects of therapist approach and client engagement with outcomes, and hypothesized that higher levels of MI-consistent language, lower levels of MI-inconsistent language, and higher global scores would be positively associated with improved drinking outcomes.

Method

Participants were 92 students at a private university in the Northeast who were required to attend a session of health education following medical evaluation for intoxication or a disciplinary hearing for an alcohol-related violation. The parent study was a randomized controlled trial that compared the efficacy of a BMI to a computer-delivered intervention (Alcohol 101; Century Council, 1998), and included follow-up assessments three and 12 months after the intervention. For a complete description of trial procedures, see Barnett and colleagues (2007). All procedures were approved by the university institutional review board, and participants gave written informed consent.

Brief Motivational Intervention

The BMI sessions were conducted by eight master's- or doctoral-level clinicians who received 30 hours of MI training followed by weekly supervision on MI and protocol adherence. The BMI condition was designed to enhance motivation to change drinking behavior, and if appropriate, collaborate with the student on creating a plan for change. There were six components to the BMI. First, *Reviewing the Event* was designed to build rapport by the counselor eliciting information from the student in a nonjudgmental fashion. The student was asked about the event that led to the mandate for treatment, as well as any concerns that may have come up in the time since the event. Second, an exploration of *Pros*

and Cons encouraged the student to describe what aspects of alcohol use he or she found to be positive, along with the negative consequences faced as a result of use. Third, the therapist initiated a discussion of *Social Influences*. Students were asked what their friends and family thought about their alcohol use, how their friends and family responded to the referral event, and in what ways the student felt influenced by friends or family attitudes. Fourth, the *Feedback Report* included information about the referral event and a summary of past-month drinking and recent alcohol-related consequences. Normative drinking data was also presented, along with information about risks associated with risk-taking or family history of alcohol problems, as appropriate. The therapist presented the report, facilitated discussion about the various sections, and asked students for their reaction to the report. Fifth, *Envisioning the Future* provided an opportunity to have the student look forward to a future both with and without making changes to their drinking. Finally, for those who were interested in changing, the therapist and client collaborated on a *Plan for Change*.

Process Coding Measurement and Procedure

A total of 112 participants were assigned to the BMI condition in the original study, of which 92 were recorded, and comprise the sample for the current study. Therapist error, recorder malfunction, and unintelligible tapes account for the missing cases. The BMI sessions were transcribed, and five trained bachelors- and masters-level raters coded therapist and client language variables with the second version of Motivational Interviewing Skill Code (MISC 2.0; Miller, Moyers, Ernst, & Amrhein, 2003). The MISC assesses 19 specific therapist behaviors that fall into three main categories: MI-consistent (affirm, emphasize control, open question, advise with permission, raise concern with permission, simple reflection, complex reflection, reframe), MI-inconsistent (advise without permission, raise concern without permission, confront, direct, warn), and other (facilitate, filler, closed question, giving information, support, structure). The MISC also has guidelines for coding patient utterances related to the target behavior change, which in this investigation was alcohol use reduction or cessation, avoidance of future alcohol-related negative consequences, or harm reduction strategies (e.g., using a designated driver, not engaging in drinking games). Seven MISC client language codes (reason, desire, need, ability, commitment, taking steps, other), were used and coded as reflecting movement toward change (change talk) or away from change (sustain talk). Client utterances that were not related to the target behavior were coded as follow/neutral. There are also three global measures of therapist skillfulness in the coding system: empathy, acceptance, and MI spirit (the latter captures respect for client autonomy, a collaborative approach, and therapist evocation of the client's own reasons for change). These global measures are designed to capture the overall *gestalt* of the therapist-patient relationship. The MISC also has a single global rating of client self-exploration during a treatment session, which reflects the client's highest level of self-exploration during the session. The manual for the Motivational Interviewing Skills Code is available at http://casaa.unm.edu/download/misc.pdf.

The study raters received approximately 40 hours of training in the MISC coding system, and participated in ongoing weekly supervision provided by three of the study authors (TRA, MM and NRM). The training protocol involved graded learning tasks, beginning with simple to increasingly complex identification of therapist, and client behaviors. Raters

progressed through a training library of role play and pilot audiotapes until rating proficiency was achieved (an intraclass correlation coefficient of .75 or greater). Weekly supervision meetings addressed coder questions, specified decision rules, and provided targeted training on low agreement items. A coding log book was used to help track coding decision rules throughout the study, and a 20% random selection of cases (n = 20) was double-coded to verify inter-rater reliability.

Participant Outcome Measures

Alcohol use—At baseline and each follow-up, a Timeline Followback (TLFB) was used to assess alcohol use over the prior 30-day period. This calendar-assisted measure is based on a participant's retrospective account of his or her drinking behavior over a specified time period (Sobell & Sobell, 1992; 1995). The TLFB has excellent reliability (α range from .79 to .98; Sobell, Maisto, Sobell, & Cooper, 1979) and high content, criterion, and construct validity (Allen & Columbus, 1995). The TLFB was scored to yield summary scores. Outcome variables included: number of heavy drinking days in the past month, average number of drinks per drinking day, and peak estimated blood alcohol concentration.

Alcohol-related problems—The Young Adult Alcohol Problems Screening Test (YAAPST; Hurlbut & Sher, 1992) was administered at baseline and each follow-up. The YAAPST is a 27-item measure that assesses the frequency of alcohol problems among college students. The YAAPST time frame was past year at baseline, and past three-months at 3-month and 12-month follow-ups, with the summed score of yes/no responses used in analyses (i.e., the total number of problems related to alcohol use that the student had experienced within that time frame). The YAAPST was specifically designed and tested on a college population, and demonstrated good internal consistency (in this study, α = .76 at the 3-month follow-up and α = .79 at the 12-month follow-up). Our primary outcome variable for alcohol problems was total number of alcohol problems reported at each follow-up point. Descriptive information for outcome variables is presented in Table 1.

Follow-up assessments

Follow-up assessments were conducted three and 12 months after the baseline assessment. All follow-up appointments were conducted in person by a research assistant who was masked to the client's treatment assignment. Follow-up rates at the 3-month assessment were (n = 88) and at the 12-month assessment were (n = 89). At baseline, as well as at both follow-up points, alcohol-related outcome variables were moderately skewed. In order to reduce skewness and improve the normality of the data, we used log transformations as recommended by Tabachnick and Fidell (2013). This resulted in reduced skewness among most variables.

Data Reduction and Analysis Plan

Consistent with previous research (Gaume, Bertholet, Faouzi, Gmel, & Daeppen, 2010; Vader et al., 2010), individual therapist codes (e.g., affirm, emphasize control, open question, advise with permission, complex reflection) were collapsed into a general category of MI-consistent. Similarly, the individual codes advise without permission, raise concern without permission, confront, direct, warn were collapsed into MI-inconsistent, and summed

across the session to facilitate analyses. For clients the seven language codes (reason, desire, need, ability, commitment, taking steps, other), reflecting movement toward change were collapsed into the general construct of change talk. The same seven categories of language that reflected movement away from change were collapsed into the construct of sustain talk, also summed across the session.

We then fit a series of hierarchical ordinary least squares (OLS) regressions. In the first step, we entered control variables (participant sex, baseline level of a given dependent variable, and session length). Step two included the language variables from the MISC (therapist MI-consistent, MI-inconsistent, client change talk and sustain talk). Finally, step three included the global ratings from the MISC (therapist acceptance and MI spirit, client self-exploration).

Results

Descriptive Information

The sample was 66% freshman, 16% sophomores, and 18% juniors, and was predominately white (67%), with about equal numbers of males (47%) and females. The primary reason for referral was a medical evaluation for intoxication (79%), with the remainder being disciplinary infractions or health service evaluations. Descriptive information on client drinking outcomes is presented in Table 1, and descriptive information about the coded therapist and client behaviors is presented in Table 2. Therapists exhibited a large number of MI-consistent statements and very few MI-inconsistent statements. The students averaged more than twice as much change talk as sustain talk. Global ratings were generally high, indicating good adherence to MI principles. Intraclass correlation coefficients (ICC; two-way mixed model, single-measures) were calculated for each variable to determine interrater reliability across rater pairs using the 20% sample of double-coded tapes. As shown in Table 2, reliabilities ranged from “fair” to “excellent,” according to criteria established by Cicchetti (1994). The global empathy rating had poor reliability (ICC = .24), so it was omitted from subsequent analyses.

Correlations among Within-session Variables

MI-consistent language was positively associated with change talk ($r = .47$, $p < .001$), and sustain talk ($r = .36$, $p < .001$). MI-inconsistent language was not significantly associated with MI-consistent language, change talk, or sustain talk (all p's > .05). Client change talk and sustain talk were positively associated ($r = .35$, $p < .001$). Global MI Spirit was positively associated with MI-consistent language ($r = .40$, $p < .001$) and therapist acceptance ($r = .76$, $p < .001$), and was negatively associated with MI-inconsistent language ($r = -.62$, $p < .001$). Therapist acceptance was negatively associated with MI-inconsistent language ($r = -.43$, $p < .001$). Finally, client self-exploration was positively associated with change talk ($r = .40$, $p < .001$).

Association of Within-session Variables and Outcomes

To examine our primary objective to investigate the relationship between within-session variables and drinking outcomes, we conducted series of hierarchical regressions, one for

each of the drinking outcomes, at the 3- and 12-month follow-ups. Tables 3 and 4 provide parameter estimates and significance levels of the magnitude of the relationship between therapist and client language variables and global ratings and each of the drinking outcomes, controlling for the three baseline covariates (participant sex, baseline level of a given dependent variable, and session length). Participant sex was associated with both fewer heavy drinking days and lower average number of drinks per drinking day at both 3-month and 12-month follow-up, as well as fewer alcohol problems reported at 3-month follow-up for women. Baseline levels of drinking variables were associated with outcomes across all four dependent variables at 3-month follow-up, and with two of the dependent variables at 12-month follow-up. Finally, longer session length was associated more alcohol-related problems at 3-month follow-up and higher average number of drinks and higher estimated BAC at 12-month follow-up.

Language variables were examined in Step Two. Higher levels of within-session sustain talk were associated with a higher number of heavy drinking days ($B = .02$, $p = .028$), higher average number of drinks per drinking day ($B = .01$, $p = .0068$), higher peak estimated BAC ($B = .002$, $p = .008$), and more self-reported alcohol problems ($B = .02$, $p = .024$) at 3-month follow-up. Higher levels of sustain talk remained predictive of higher number of heavy drinking days ($B = .02$, $p = .021$), average number of drinks per drinking day ($B = .01$, $p = .007$), higher peak estimated BAC ($B = .002$, $p = .016$), and more alcohol-related problems ($B = .02$, $p = .017$) at 12-month follow-up. Neither client change talk nor therapist MI-consistent or MI-inconsistent language was associated with any of the drinking outcomes at either timepoint.[1]

Step Three examined the relationship between global ratings and outcomes. Neither of the two therapist global ratings (acceptance, MI spirit) was associated with drinking outcomes at either follow-up. However, higher client self-exploration was predictive of a lower number of heavy drinking days ($B = -.25$, $p = .019$) at 3-month follow-up, as well as fewer average number of drinks per drinking day ($B = -.16$, $p = .010$) and lower peak estimated BAC ($B = -.03$, $p = .013$) at 12-month follow-up.

[1]The latest version of the Motivational Interviewing book (Miller & Rollnick, 2013) distinguishes between “preparatory” and “mobilizing” forms of change talk and sustain talk. In this conceptualization, preparatory talk represents consideration of change and mobilizing talk signals movement toward a resolution of a change decision. We were intrigued as to how results might be altered if these two forms of talk were separated in the analysis. Although the MISC wasn't designed to measure preparatory versus mobilizing language, the coding system does contain individual subcodes that map on well to these newly conceived constructs. In an exploratory analysis, we grouped the client language subcodes of desire, ability, reasons, and need into two composite categories: preparatory change talk and preparatory sustain talk. Similarly, we grouped the commitment and taking steps subcodes into two new composite variables: preparatory change talk and mobilizing sustain talk. We then repeated the hierarchical regression analyses described above. The pattern of results remained similar to our initial results (sustain talk continued to predict some outcomes), but in a less compelling fashion. Specifically, preparatory sustain talk was significantly associated with average drinks per drinking day ($B = .08$, $p = .012$) and higher peak estimated BAC ($B = .01$, $p = .014$) at 3-month follow-up, and with average number of drinks per drinking day ($b = .05$, $p = .037$), peak estimated BAC ($B = .01$, $p = .048$), and alcohol problems ($B = .08$, $p = .035$) at 12-month follow-up. However, mobilizing sustain talk was not associated with any drinking outcomes across either time point. In addition, neither preparatory nor mobilizing change talk was associated with any of the drinking outcomes across either follow-up. Hence, dividing change talk and sustain into the conceptual groupings of “preparatory” versus “mobilizing” language did not seem to increase the explanatory value of the current analyses.

Discussion

To our knowledge, this is the first study to examine the relationship between client within-session language and follow-up alcohol use and related problems among mandated college students receiving a motivational intervention. In contrast to previous research that has identified change talk as a main predictor of drinking outcomes, current findings indicate that student statements of sustain talk, but not change talk, predicted increased alcohol use and related problems at both follow-up time-points. We can posit a few reasons for these findings. First, differences in the population targeted for an MI may determine whether change talk or sustain talk would be the more important variable associated with outcomes. Sustain talk may be particularly relevant among clients who are non-treatment seeking (e.g., Baer et al., 2008), or otherwise less motivated to make changes at the outset of the motivational interview. Specifically, students had the opportunity to be involved in this study because they were required to participate in a remedial event due to a campus alcohol violation. As such, participation in the study may have been regarded by students as "the lesser of two evils." Therefore, these students did not constitute a treatment-seeking group, among which change talk language has been shown to be the stronger predictor of outcome (e.g., Moyers, Martin, Houck, Christopher, & Tonigan, 2009). While other researchers have noted an association between sustain talk and outcomes (Baer et al., 2008; Moyers et al., 2007; Vader et al., 2010), these studies have also shown a parallel finding of a positive relationship between change talk and outcomes. This relationship was not replicated in this study.

In the *technical hypothesis* of MI efficacy, therapist behaviors consistent with the MI approach (MI-consistent) should be associated with greater change talk and *less* sustain talk, which should then be associated with changes in outcomes (Arkowitz, Westra, Miller, & Rollnick, 2008; Miller & Rose, 2009). In the current sample, however, therapist MI-consistent behaviors were associated with *both* positive and negative change statements. These positive associations among therapist MI-consistent behavior and both client change talk and sustain talk have been previously reported in other studies (Gaume et al., 2010; Moyers et al., 2007; Vader et al., 2010), and may be indicative of greater exploration of ambivalence as prescribed in MI. That is, greater exploration of ambivalence should produce some resistance (as manifested through sustain talk). Sustain talk remained a powerful predictor of poor outcomes even after controlling for a number of covariates that might have explained this association. This suggests that those students who vocalized more sustain talk during the session had either resolved any ambivalence the session had evoked in favor of not changing, or that any commitment to change made in the session was not firm enough to result in behavior change in the months that followed.

The BMI was intended to provide a safe and non-judgmental atmosphere for the exploration and resolution of ambivalence regarding change. Because the global measure of therapist acceptance was predictive of some drinking reductions, this study lends some support to the hypothesis that MI has *relational* aspects (global approach) in addition to *technical* aspects (specific behaviors) that are important in the change process (Miller & Rose, 2009). This support was bolstered by the finding that the global measure of higher client self-exploration was strongly predictive of improved drinking outcomes (even more strongly at 12 months

than at 3 months), indicating that students who were more engaged in the therapeutic encounter were more likely to benefit from the intervention.

Limitations

This study has limitations to consider. First, the parent study did not find strong support for the efficacy of this BMI relative to a less intensive intervention, and the present study involved a within-BMI analysis of mechanisms. The failure of change talk to predict outcomes, as well as the strong relationship between sustain talk and poorer outcomes, may reflect the low strength efficacy of the BMI in the parent study, and results may not be supported in a more efficacious intervention. Second, therapist and student behaviors were summed over the session to create the study variables. These summary variables do not capture the temporal sequence of the interactions, precluding examination of reciprocal influences of client behavior on therapist behavior, as well as therapist behavior on client behavior. Relatedly, because the MISC rates utterances as session summaries, it is not known what the reliability is at the utterance level. That is, two raters could both identify two instances of confrontation, but they might not be the same utterances. This is a limitation for therapy process coding generally and for use of the MISC coding system in particular. The low reliability found among several study variables in this study is a limitation shared by other studies using the MISC coding system. Such measurement error may indicate that some MISC codes are simply unreliable, a potential fundamental problem the MI coding field must contend with better than it has previously. We do not know the impact of the current measurement error for the current results.

Findings might not reflect the within-session processes in other mandated interventions or substance use interventions more widely. Specifically, these analyses were conducted on BMI sessions from an efficacy trial, where there was a high priority on training therapists and maintaining fidelity to the BMI, which necessarily restricted therapist variability. As a result, therapists produced very few MI-inconsistent utterances. Replicating this study with a community sample or in the context of an effectiveness trial where more therapist MI-inconsistent language might be observed may reveal a different pattern of findings.

The parent study included the use of specified training and supervision, and use of an MI treatment manual in an effort to establish treatment fidelity. Yet, recent meta-analyses suggest that MI can be less efficacious when implementation is guided by use of a manual (Hettema, Steele, & Miller, 2005; Lundahl, Kunz, Brownell, Tollefson, & Burke, 2010). Hence, current results should be interpreted with caution, given that MI is a client-centered approach in which a manual could lead clinicians focusing unduly on “what they're supposed to do” rather than being truly responsive to individual client needs. Future studies could explicitly test how the relationship of MI process variables and treatment outcomes differ based on whether or not the intervention is manual-guided. Finally, campus policy where the current study was conducted strongly encourages individuals to call for medical assistance for themselves or others who may be dangerously intoxicated. Students who seek such medical evaluation for alcohol intoxication may subsequently be required to meet with a professional in the campus office of Health Education. Participants in the current study were students who had been required to attend a session of health education following a

medical evaluation for intoxication or after a disciplinary hearing for an alcohol-related violation. However, campus alcohol policy and enforcement differ across campuses. Hence, students who participated in this study may have been a select group (i.e., largely made up of those who were transported to the emergency department for intoxication). Such differences in campus policies that impact which students receive BMIs may limit the generalizability of findings to campuses that have similar policies and enforcement practices.

Conclusions

This study was designed to test whether the associations between client and therapist language and outcomes observed in earlier studies would be replicated in a BMI with this mandated college population. The hypothesis that change talk would lead to better drinking outcomes in a BMI with mandated college students was not supported. Rather, students who were mandated to receive a brief motivational intervention following an alcohol-related incident and still seemed resistant to changing their drinking (as evidenced through higher levels of sustain talk) were more likely to experience poorer outcomes up to a year later. Some support was found for the technical MI hypothesis, as therapist MI-consistent behaviors seemed to facilitate exploring ambivalence, increasing sustain talk as well as change talk, rather than only increasing change talk and decreasing sustain talk. Relational factors seem to be important as well, especially the client's self-exploration. Taken together, results highlight the benefits of continued study of the mechanisms of change for motivational interviewing, especially the role of sustain talk and relational therapeutic factors.

Acknowledgments

This work was supported by National Institute on Alcohol Abuse and Alcoholism grants R01 AA017874 to T. Apodaca, R01 AA017427 to B. Borsari, and R01 AA12158 to N. Barnett. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Alcohol Abuse and Alcoholism or the National Institutes of Health, or the Department of Veterans Affairs or the United States Government. The authors would like to thank the students and therapists who allowed their audiotapes to be utilized for this study.

References

Allen, JP.; Columbus, M. Assessing alcohol problems (NIH Pub. 95-3745). Rockville, MD: 1995.

Amrhein PC, Miller WR, Yahne CE, Palmer M, Fulcher L. Client commitment language during motivational interviewing predicts drug use outcomes. Journal of Consulting and Clinical Psychology. 2003; 71(5):862–878.10.1037/0022-006X.71.5.862 [PubMed: 14516235]

Arkowitz, H.; Westra, HA.; Miller, WR.; Rollnick, S. Motivational Interviewing in the Treatment of Psychological Problems. New York, NY: Guilford; 2008.

Baer JS, Beadnell B, Garrett SB, Hartzler B, Wells EA, Peterson PL. Adolescent change language within a brief motivational intervention and substance use outcomes. Psychology of Addictive Behaviors. 2008; 22(4):570–575.10.1037/a0013022 [PubMed: 19071983]

Barnett NP, Murphy JG, Colby SM, Monti PM. Brief motivational intervention vs. computerized alcohol education with college students mandated to intervention. Addictive Behaviors. 2007; 32:2529–2548.10.1016/j.addbeh.2007.06.017 [PubMed: 17707594]

Borsari B, Hustad JTP, Mastroleo NR, O'Leary Tevyaw T, Barnett NP, Kahler CW, Short EE, Monti PM. Addressing alcohol use and problems in mandated college students: A randomized clinical trial

using stepped care. Journal of Consulting and Clinical Psychology. 2012; 80:1062–1074.10.1037/a0029902 [PubMed: 22924334]

Borsari B, Carey KB. Effects of a brief motivational intervention with college student drinkers. Journal of Consulting and Clinical Psychology. 2000; 68(4):728–733.10.1037//0022-006X.68.4.728 [PubMed: 10965648]

Borsari B, Carey KB. Two brief alcohol interventions for mandated college students. Psychology of Addictive Behaviors. 2005; 19(3):296–302.10.1037/0893-164X.19.3.296 [PubMed: 16187809]

Borsari B, O'Leary-Tevyaw T, Barnett NP, Kahler CW, Monti PM. Stepped care for mandated college students: A pilot study. The American Journal on Addictions. 2007; 16:131–137.10.1080/10550490601184498 [PubMed: 17453615]

Carey KB, Scott-Sheldon LAJ, Carey MP, DeMartini KS. Individual-level interventions to reduce college student drinking: A meta-analytic review. Addictive Behaviors. 2007; 32(11):2469–2494.10.1016/j.addbeh.2007.05.004 [PubMed: 17590277]

Century Council. Alcohol 101 (Interactive CD-ROM Program). 1998

Cicchetti DV. Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. Psychological Assessment. 1994; 6:284–290.10.1037/1040-3590.6.4.284

Cronce JM, Larimer ME. Individual-focused approaches to the prevention of college drinking. Alcohol, Research & Health. 2011; 34:210–221. [PubMed: 22330220]

Gaume J, Bertholet N, Faouzi M, Gmel G, Daeppen JB. Counselor motivational interviewing skills and young adult change talk articulation during brief motivational interventions. Journal of Substance Abuse Treatment. 2010; 39(3):272–281.10.1016/j.jsat.2010.06.010 [PubMed: 20708900]

Gaume J, Gmel G, Faouzi M, Daeppen JB. Counsellor behaviours and patient language during brief motivational interventions: a sequential analysis of speech. Addiction. 2008; 103:1793–1800.10.1111/j.1360-0443.2008.02337.x [PubMed: 19032529]

Hingson RW, Heeren T, Winter M, Wechsler H. Magnitude of alcohol-related mortality and morbidity among US college students ages 18-24: Changes from 1998-2001. Annual Review of Public Health. 2005; 26:259–279.10.1146/annurev.publhealth.26.021304.144652

Hurlbut SC, Sher KJ. Assessing alcohol problems in college students. Journal of American College Health. 1992; 41(2):49–58.10.1080/07448481.1992.10392818 [PubMed: 1460173]

Kazdin AE, Nock MK. Delineating mechanisms of change in child and adolescent therapy: methodological issues and research recommendations. Journal of Child Psychology and Psychiatry. 2003; 44(8):1116–1129.10.1111/1469-7610.00195 [PubMed: 14626454]

Larimer ME, Cronce JM. Identification, prevention, and treatment revisited: individual-focused college drinking prevention strategies 1999-2006. Addictive Behaviors. 2007; 32:2439–2468.10.1016/j.addbeh.2007.05.006 [PubMed: 17604915]

Lundahl BW, Kunz C, Brownell C, Tollefson D, Burke BL. A meta-analysis of motivational interviewing: Twenty-five years of empirical studies. Research on Social Work Practice. 2010; 20:137–160.10.1177/1049731509347850

McNally AM, Palfai TP, Kahler CW. Motivational interventions for heavy drinking college students: examining the role of discrepancy-related psychological processes. Psychology of Addictive Behaviors. 2005; 19(1):79–87.10.1037/0893-164X.19.1.79 [PubMed: 15783281]

Miller, WR.; Moyers, TB.; Ernst, D.; Amrhein, P. Manual for the motivational interviewing skills code (MISC) Version 2.0. 2003. Retrieved April 19, 2009, from http://www.motivationalinterview.org/training/MISC2.pdf

Miller, WR.; Rollnick, S. Motivational Interviewing, Third Edition: Helping People Change. New York, NY: Guilford; 2013.

Miller WR, Rose GS. Toward a theory of motivational interviewing. American Psychologist. 2009; 64(6):527–537.10.1037/a0016830 [PubMed: 19739882]

Moyers TB, Martin T, Christopher PJ, Houck JM, Tonigan JS, Amrhein PC. Client language as a mediator of motivational interviewing efficacy: Where is the evidence? Alcoholism: Clinical and Experimental Research. 2007; 31(10 Suppl):40s–47s.10.1111/j.1530-0277.2007.00492.x

Moyers TB, Martin T, Houck JM, Christopher PJ, Tonigan JS. From in-session behaviors to drinking outcomes: A causal chain for motivational interviewing. Journal of Consulting and Clinical Psychology. 2009; 77(6):1113–1124.10.1037/A0017189 [PubMed: 19968387]

Moyers TB, Miller WR, Hendrickson SML. How does motivational interviewing work? Therapist interpersonal skill predicts client involvement within motivational interviewing sessions. Journal of Consulting and Clinical Psychology. 2005; 73:590–598.10.1037/0022-006X.73.4.590 [PubMed: 16173846]

Porter J. Alcohol arrests amongst college students continue to increase. Chronicle of Higher Education. 2006 Oct 27.

Sobell LC, Maisto SA, Sobell MB, Cooper AM. Reliability of alcohol abusers' self-reports of drinking behavior. Behaviour Research & Therapy. 1979; 17(2):157–160. [PubMed: 426744]

Sobell, LC.; Sobell, MB. Timeline Followback: A technique for assessing self-reported ethanol consumption. In: Litten, RZ.; Allen, JP., editors. Measuring alcohol consumption: Psychosocial and biological methods. Totowa, NJ: Humana Press; 1992. p. 41-72.

Sobell, LC.; Sobell, MB. Alcohol consumption measures. In: Allen, JP.; Columbus, M., editors. Assessing Alcohol Problems: A Guide for Clinicians and Researchers. Rockville, MD: National Institute on Alcohol Abuse and Alcoholism; 1995. p. 55-73.

Tabachnick, BG.; Fidell, LS. Using Multivariate Statistics. 6th. Boston: Allyn and Bacon; 2013.

Tollison SJ, Mastroleo NR, Mallett KA, Witkiewitz K, Lee CM, Ray AE, Larimer ME. The relationship between baseline drinking status, peer motivational interviewing microskills, and drinking outcomes in a brief alcohol intervention for matriculating college students: A replication. Behavior Therapy. 2013; 44:137–151.10.1016/j.beth.2012.09.002 [PubMed: 23312433]

Vader AM, Walters ST, Prabhu GC, Houck JM, Field CA. The language of motivational interviewing and feedback: counselor language, client language, and client drinking outcomes. Psychology of Addictive Behaviors. 2010; 24:190–197.10.1037/a0018749 [PubMed: 20565145]

Walters ST, Vader AM, Harris TR, Field CA, Jouriles EN. Dismantling motivational interviewing and feedback for college drinkers: A randomized clinical trial. Journal of Consulting and Clinical Psychology. 2009; 77:64–73.10.1037/a0014472 [PubMed: 19170454]

Wechsler H, Lee JE, Kuo M, Seibring M, Nelson TF, Lee H. Trends in college binge drinking during a period of increased prevention efforts Findings from 4 Harvard School of Public Health College Alcohol Study surveys 1993-2001. Journal of American College Health. 2002; 50:203–217.10.1080/07448480209595713 [PubMed: 11990979]

White HR, Morgan TJ, Pugh LA, Celinska K, Labouvie EW, Pandina RJ. Evaluating two brief substance-use interventions for mandated college students. Journal of Studies on Alcohol. 2006; 67(2):309–317. [PubMed: 16562414]

Table 1

Descriptive Information of Drinking-Related Variables

	Baseline		3-month		12-month	
	M	***SD***	***M***	***SD***	***M***	***SD***
Number of heavy drinking days	3.35	3.29	2.62	2.87	3.52	4.29
Average number of drinks per drinking day	5.81	3.60	5.01	3.06	4.91	2.75
Peak estimated blood alcohol concentration	0.20	0.10	0.14	0.09	0.15	0.09
Alcohol problems reported on YAAPST	5.84	2.93	3.23	2.86	2.92	2.52

Note. N = 92.

Table 2

Descriptive Information of Within-Session Variables

	M	*SD*	Range	ICC[a]	Proportion[b]
Language					
Therapist MI-consistent	82.6	29.7	12-173	.97	46%
Therapist MI-inconsistent	0.8	1.5	0-8	.47	<1%
Client change talk	51.8	20.6	8-116	.85	37%
Client sustain talk	21.7	10.5	4-49	.54	16%
Global Ratings					
Therapist acceptance	6.00	0.78	4-7	.47	
Therapist MI spirit	5.43	1.06	2-7	.68	
Client Self-exploration	5.39	0.86	3-7	.45	
Session length (minutes)	53.4	10.5	25-85		

Note. N = 92.

[a] ICC = intraclass correlation coefficient. Reliability estimates based on a 20% sample (n = 20) of double-coded tapes. Cicchetti (1994) suggests the following guidelines for assessing reliability of observational coding systems: ICC of .75 or above = excellent; .60-.74 = good; .40-.59 = fair; below .40 = poor.

[b] Proportion = percentage of all speaker language within the session.

Table 3

Hierarchical Prediction of 3-Month Drinking Outcomes from Baseline Variables, Therapist and Client Language Variables, and Global Ratings

	Number of heavy drinking days		Average number of drinks per drinking day		Peak estimated blood alcohol concentration		Alcohol problems reported on YAAPST	
Baseline(Step 1)	*B*	95% CI	*B*	95% CI	*B*	95% CI	*B*	[95% CI]
Sex	-.35*	[-.63, -.07]	-.30*	[-.50,-.09]	-.03	[-.06,.01]	-.31*	[-.59,-.04]
Baseline drinking	.62***	[.42, .81]	.30**	[.09,.52]	.31**	[.10,.52]	.89***	[.52,1.25]
Session length	.005	[-.01, .02]	-.001	[-.01,.01]	-.001	[-.002,.002]	.01*	[.001,.03]
	R^2 = .41		R^2 = .25		R^2 = .13		R^2 = .34	
Language (Step 2)								
MI-consistent	.002	[-.01, .004]	-.001	[-.01,.01]	-.001	[-.001,.001]	-.001	[-.01,.01]
MI-inconsistent	-.05	[-.14, .04]	.02	[-.06,.10]	.01	[-.01,.02]	.01	[-.08,.09]
Change talk	.004	[-.004, .01]	-.001	[-.01,.01]	.001	[-.001,.001]	.003	[-.01,.01]
Sustain talk	.02*	[.002, .03]	.01**	[.01,.02]	.002**	[.001,.01]	.02*	[.002,.03]
	R^2 = .47; ΔR^2 = .06		R^2 = .34; ΔR^2 = .09		R^2 = 26; ΔR^2 = .13*		R^2 = .41; ΔR^2 = .07	
Global ratings (Step 3)								
Therapist acceptance	-.16	[-.43, .11]	-.06	[-.27, .16]	-.01	[-.06,.03]	.12	[-.18,.42]
Therapist MI spirit	.01	[-.23, .25]	.02	[-.17,.20]	.01	[-.02,.05]	-.01	[-.21,.26]
Client self-exploration	-.25*	[-.46, -.04]	-.09	[-.24,.07]	-.01	[-.05,.02]	-.09	[-.30,.13]
	R^2 = .53; ΔR^2 = .06*		R^2 = .36, ΔR^2 = .02		R^2 = .28; ΔR^2 = .02		R^2 = .42; ΔR^2 = .01	

Note. *n*s range from 71 to 85. CI = confidence interval. YAAPST = Young Adult Alcohol Problems Screening Test.

* $p < .05$,

** $p < .01$,

*** $p < .001$.

Table 4

Hierarchical Prediction of 12-Month Drinking Outcomes from Baseline Variables, Therapist and Client Language Variables, and Global Ratings

	Number of heavy drinking days		Average number of drinks per drinking day		Peak estimated blood alcohol concentration		Alcohol problems reported on YAAPST	
Baseline(Step 1)	*B*	95% CI	*B*	95% CI	*B*	95% CI	*B*	95% CI
Sex	-.37*	[-.69, -.06]	-.20*	[-.38, -.02]	.01	[-.03, .04]	-.23	[-.54, .08]
Baseline drinking	.58***	[.36, .81]	.39***	[.20, .59]	.14	[-.07, .36]	.32	[-.08, .72]
Session length	.003	[-.01, .02]	.01*	[.001, .02]	.002*	[.001, .004]	.01	[-.001, .03]
	R^2 = .32		R^2 = .32		R^2 = .13		R^2 = .12	
Language (Step 2)								
MI-consistent	.001	[-.005, .01]	.001	[-.002, .004]	.001	[-.0002, .001]	.004	[-.002, .01]
MI-inconsistent	-.02	[-.12, .09]	-.01	[-.08, .05]	.002	[-.01,.02]	-.08	[-.17, .02]
Change talk	-.01	[-.01, .004]	-.002	[-.01, .002]	-.001	[-.002, .001]	-.004	[-.01, .004]
Sustain talk	.02*	[.003, .04]	.01**	[.003, .02]	.002*	[.001, .004]	.02*	[.004, .04]
	R^2 = .37; ΔR^2 = .05		R^2 = .40, ΔR^2 = .08*		R^2 = .24; ΔR^2 = .11*		R^2 = .27; ΔR^2 = .15**	
Global ratings (Step 3)								
Therapist acceptance	-.04	[-.36, .29]	.07	[-.11, .24]	.02	[-.02, .05]	.13	[-.18, .44]
Therapist MI spirit	-.13	[-.42, .16]	-.04	[-.19, .11]	-.01	[-.04, .02]	-.15	[-.42, .12]
Client self-exploration	-.11	[-.35, .12]	-.16**	[-.29, -.04]	-.03*	[-.06, -.01]	-.18	[-.39, .04]
	R^2 = .40; ΔR^2 = .03		R^2 = .46, ΔR^2 = .06		R^2 = .31; ΔR^2 = .07		R^2 = .31; ΔR^2 = .04	

Note. *n*s range from 71 to 85. CI = confidence interval. YAAPST = Young Adult Alcohol Problems Screening Test.

* $p < .05$,

** $p < .01$,

*** $p < .001$.