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The Language of Motivational Interviewing and Feedback: Counselor Language, Client Language, and Client Drinking Outcomes

Amanda M. Vader and Scott T. Walters
University of Texas School of Public Health

Gangamma Chenenda Prabhu
University at Buffalo School of Medicine and Biomedical Sciences

Jon M. Houck
University of New Mexico

Craig A. Field
University of Texas at Austin

Previous research has suggested that motivational interviewing (MI) may affect client language, which in turn predicts client drinking outcome. In this study, we examined the relationship between counselor language and client language, personalized feedback and client language, and client language and client drinking outcome, in a sample of heavy-drinking college students. MI was delivered in a single session with or without a personalized feedback report (MI with feedback [MIF]; MI only). Sessions were coded using the Motivational Interviewing Skill Code 2.1. A composite drinking outcome score was used, consisting of drinks per week, peak blood alcohol concentration, and protective drinking strategies. We found three main results. First, in the MIF group, MI consistent counselor language was positively associated with client change talk. Second, after receiving feedback, MIF clients showed lower levels of sustain talk, relative to MI only clients. Finally, in the MIF group, clients with greater change talk showed improved drinking outcomes at 3 months, while clients with greater sustain talk showed poorer drinking outcomes. These results highlight the relationship between counselor MI skill and client change talk, and suggest an important role for feedback in the change process.

Keywords: motivational interviewing, counseling, psycholinguistics, college students, alcohol

Motivational interviewing (MI) is a counseling style with many published studies supporting its efficacy in the treatment of addictive and other health behaviors (Hettema, Steele, & Miller, 2005; Rubak, Sandboek, Lauritzen, & Christensen, 2005). MI has been described as a "client-centered, directive counseling style for eliciting behavior change by helping clients to explore and resolve ambivalence" (Miller & Rollnick, 2002, p. 25). For the past 30 years, research into MI (and other treatment approaches) has focused mainly on treatment efficacy through the use of randomized clinical trials; however, more recently there has been an interest in understanding the mechanisms by which such interventions exert their effect (DiClemente, 2007; Kazdin & Nock, 2003; Longabaugh et al., 2005; Nock, 2007). Theoretically, it is thought that MI helps to shape clients' language by eliciting and selectively reinforcing statements in support of change (Miller & Rollnick, 2002). Specifically, Hettema and colleagues have hypothesized that (1) MI increases motivation for change and decreases resistance toward change, (2) the extent to which clients voice reasons for change is positively related to the amount of subsequent change, and (3) the extent to which clients voice reasons against change is negatively related to the amount of subsequent change (Hettema et al., 2005). The theoretical rationale for the first proposition is drawn from client-centered counseling and Roger's "critical conditions" for change (Rogers, 1957); support for the second and third propositions come from self-perception theory (Bem, 1972), which holds that as clients hear their own arguments for or against change they become more convinced of their own convictions.

Following this logic, some studies have focused on client language as a predictor of client outcome. "Change talk" (CT) has been defined as client expressions of the benefits of change, hope or optimism around change, or dissatisfaction with current behavior (Miller & Rollnick, 2002). "Sustain talk" (ST) is defined as client expressions of the benefits of the status quo, pessimism around change, or satisfaction with current behavior. In an important initial study, Amrhein, Miller, Yahne, Palmer, and Fulcher (2003) found that client language, specifically a subtype termed "commitment language," predicted drinking outcome. An important contribution of Amrhein's study was empirical support for

Amanda M. Vader and Scott T. Walters, University of Texas School of Public Health; Gangamma Chenenda Prabhu, Department of Neurology, State University of New York, University at Buffalo School of Medicine and Biomedical Sciences; Jon M. Houck, Department of Psychology, University of New Mexico; Craig A. Field, School of Social Work, University of Texas at Austin.

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Correspondence concerning this article should be addressed to Scott T. Walters, University of Texas School of Public Health, 5323 Harry Hines Blvd., V8.112, Dallas, TX 75390-9128. E-mail: Scott.Walters@utsouthwestern.edu

subtypes of change and sustain talk, specifically desire, ability, reasons, need, and commitment to change. Other studies have found client behavior change to be predicted by specific aspects of client language, such as statements of ability to change (Gaume, Gmel, & Daeppen, 2008) and reasons for change and desire/ability against change (negative statements predicting worse outcomes; Baer et al., 2008). More generally, Moyers et al. (2007) found that aggregate CT predicted improved drinking outcomes and aggregate ST predicted worse drinking outcomes. This body of work suggests that client language is an important predictor of subsequent behavior, although it is unknown whether such language is merely a marker of some other internal change, or if the language is actually functioning as a mechanism of change.

A second group of studies has focused on the relationship between counselor and client language. Research has generally found support for the hypothesized language mechanisms: Counselor language consistent with MI (MICO) has been positively associated with client CT (Catley et al., 2006; Miller, Benefield, & Tonigan, 1993), and counselor language inconsistent with MI (MIIN) has been positively associated with client ST (Miller et al., 1993). This relationship also holds when looking at the temporal sequence of within-session language. Moyers and Martin (2006) and Moyers et al. (2007) both found that, within a single counseling session, MICO statements were more likely to be followed by CT and less likely to be followed by ST, while MIIN was more likely to be followed by ST. Only a few studies have addressed the question of whether counselor language affects client outcomes. Miller et al. (1993) found that more confrontation predicted greater client drinking after 1 year, but Gaume et al. (2008) failed to find a direct effect of counselor language on client outcome.

This small, but growing literature suggests that counselor language is an important predictor of client outcome. Specifically, MI consistent counselor language is more likely to produce positive client language and MI inconsistent counselor language is more likely to produce negative client language. In turn, positive client language leads to positive client outcomes and negative client language leads to negative outcomes. Together these two findings (counselor language to client language and client language to client outcome) create a chain of behaviors that can be tested collectively in a single study. Only one study (Moyers, Martin, Houck, Christopher, & Tonigan, 2009) has examined this chain in its entirety, finding some support for a mediational role of client language.

In this study, we used coded session tapes from a larger study designed to dismantle MI and feedback among heavy-drinking college students (Walters, Vader, Harris, Field, & Jouriles, 2009). The dismantling aspect of the parent study allowed us to compare MI delivered with or without a feedback report. This opportunity was significant because almost all past coding studies have examined the MI with feedback format (i.e., "Drinker's Check-Up," Motivational Enhancement Therapy), rather than MI alone. As reviewed by Walters and Neighbors (2005), feedback typically uses information from the client's assessment to present personal drinking patterns, comparisons of the client's drinking to population drinking norms, risk factors for heavy drinking, and drinking-related negative consequences. Not only does the study design allow a comparison of two formats of MI (with and without feedback), but the results of the parent study created additional interest. In the parent study, we found that only MI with feedback significantly reduced drinking over assessment (Walters et al., 2009). We wondered whether the counselor and client language might help explain why MI with feedback outperformed MI alone, and thus were interested whether language expressed during the counseling sessions might differ between the two groups, and whether language would be differentially associated with outcome.

The study extends previous literature by examining the link between counselor language, client language, and client drinking outcome, and uniquely examines this relationship with and without the presence of a personalized feedback report among heavy-drinking college students. Specifically, this study was designed to answer 3 questions: (1) What is the relationship between counselor language and client language? (2) Does the inclusion of a personalized feedback profile affect client language over MI alone? (3) Does client language predict client drinking outcome?

Method

This study used data from videotaped counseling sessions of a study evaluating the separate and collective effects of MI, feedback, and assessment, among heavy-drinking college students. Study procedures are described briefly later.

Participants

During Fall 2006 and Spring 2007, students were recruited from a medium sized private university in the southern United States using a variety of recruitment tools, such as mass emails, posters, and class presentations. The study was advertised simply as a "research study looking at patterns of drinking" among college students. Interested students completed online screening questions to determine eligibility. Participants were at least 18 years old and reported consuming five or more drinks for men or four or more drinks for women, in one sitting in the past 2 weeks. Screening, randomization, and treatment conditions are described elsewhere (Walters et al., 2009). The two study conditions addressed in the present analyses are (1) A single session of MI with a personalized feedback report (MIF; $n = 73$) and (2) A single session of MI only, without a personalized feedback report (MIO; $n = 70$). The project was approved by the Institutional Review Boards of the University of Texas Health Science Center at Houston and the university from which the study participants were recruited.

Measures

At baseline, the participants provided demographic information, about age, race/ethnicity, gender, year in school, fraternity or sorority membership, and place of residence. At baseline, 3, 6, and 12 months, the participants also provided information about self-reported drinks per week, peak blood alcohol concentration (BAC), and protective behaviors, from which we created composite drinking scores. Drinks per week was calculated from a 7-day drinking calendar adapted from the Daily Drinking Questionnaire (Collins, Parks, & Marlatt, 1985). Peak BAC was calculated using weight, gender, number of drinks, and duration of the heaviest drinking episode in the past month. Protective behaviors were measured by the 15-item Protective Behavioral Strategies Survey (Martens et al., 2005). The participants were asked which protective behaviors, such as avoiding drinking games or setting a limit

on the number of drinks, they had used in the previous 3 months. Prior research has found generally greater effects of client language on drinking outcomes at shorter follow-up points (e.g., Baer et al., 2008; Strang & McCambridge, 2004), and thus we chose to focus on our first follow-up point.

Intervention Format

The MIF and MIO sessions were delivered by two PhD level counselors and five clinical psychology doctoral students. Each counselor conducted both types of sessions. Prior to seeing participants, counselors completed 40 hours of training in MI (including lecture, role play, and practice) and submitted four practice tapes, which were reviewed by the study supervisor. When conducting study sessions, counselors completed a checklist to ensure intervention protocols were followed. Throughout the study, counselors met with the supervisor to discuss questions and issues and review recordings of recent sessions. The MIF and MIO sessions were designed to be identical, except for the presentation of the feedback profile, and followed similar protocols that created distinct segments within the sessions. Both began with an orientation where confidentiality issues and the purpose of the session were explained, followed by an exploration of the participant's typical drinking patterns, a time when the participant drank too much, and the pros and cons of drinking. Next, in the MIF sessions, the counselors presented the participant's personalized feedback report, which included a quantity/frequency drinking summary, money spent and calories consumed from alcohol, risk factors, and information comparing their drinking to US adult and college student norms. Finally, both MIF and MIO sessions concluded with "Readiness Rulers" to elicit importance and confidence about change, a discussion about hypothetical or actual change, and, if appropriate, developing a plan for change. In brief, we call the three segments the Interview, Feedback, and Rulers. Because of the addition of the feedback report, MIF sessions were somewhat longer than MIO sessions (MIF, M = 45:46 min, SD = 14:13; MIO, M = 36:52 min, SD = 9:35; $t(58)=2.84$, p = .006). There were no significant differences between the two groups in terms of the length of the common (i.e., Interview or Rulers) segments. In addition, in our previously published outcome results, we found that session length did not predict changes in client drinking when holding intervention group constant (Walters et al., 2009).

Coding Procedures

Two coders received training in the Motivational Interviewing Skill Code (MISC 2.1; Miller, Moyers, Ernst, & Amrhein, 2008) in the form of graded tasks and practice sessions totaling to about 40 hours over 12 weeks. None of the tapes from the study data set were used for training. Of the 126 session recordings from the parent clinical trial, 64 were MIF and 62 were MIO. A random sample of 60 tapes (30 MIF and 30 MIO) was coded using the MISC. Each tape was coded by one of the two coders. In addition, both coders independently coded a random subset of tapes (26.7%, n = 16) to determine inter-rater reliability, which was estimated using intra-class correlations (ICC; Shrout & Fleiss, 1979). Following the recommendations of Cicchetti (1994), ICCs were categorized as poor (<.40), fair (.40–.59), good (.60–.74), and excellent (.75–1.00).

The MISC consists of *global ratings* and *behavior counts* for both the counselor and client. Global ratings captured the coder's overall impression of the session. All global ratings were scored on a 7-point Likert scale, with 1 representing the absence of the characteristic and 7 representing high levels of the characteristic. Behavior counts captured the frequency of specific types of language. The unit of coding for behaviors counts was an utterance, or complete thought. The MISC manual, with more detailed information, is available at http://casaa.unm.edu/download/misc.pdf. In this study, the entire session was coded with the coder listening through twice: first scoring the global ratings and behavior counts for the counselor, and second scoring the client. Because the sessions were divided into distinct segments (Interview, Feedback, and Rulers), the behavior counts for each segment were recorded separately. The global ratings were scored for each session in its entirety.

Counselor. There were three global ratings for the counselor: Acceptance, Empathy, and MI Spirit (a combination of Collaboration, Evocation, and Autonomy/Support). For the counselor, there were 19 different behavior count categories (*Advise with permission, Advise without permission, Affirm, Confront, Direct, Emphasize control, Facilitate, Filler, Giving information, Closed question, Open question, Raise concern with permission, Raise concern without permission, Simple reflection, Complex Reflection, Reframe, Support, Structure,* and *Warn*). These categories were used to calculate several summary scores (see Table 1), including MICO (*Advise with permission, Affirm, Emphasize control, Open question, Simple Reflection, Complex Reflection, Reframe,* and *Support*) and MIIN (*Advise without permission, Confront, Direct, Raise concern without permission,* and *Warn*).

Client. The client was evaluated on a single global rating of Self-Exploration, based on his or her highest level of elaboration on personally relevant information. The client behavior count categories included *commitment, reason, desire, ability, need, taking steps, other, and follow/neutral*. For each of the client behavior count categories, a further distinction was made as to whether the client's statement was for or against change. When the client made a statement in favor of change, it was coded as CT, and when the statement was against change (or in favor of the status quo), it was coded as ST. For example, the Reason behavior counts were divided as either Reason-Change Talk or Reason-Sustain Talk. Client language that was not about the targeted behavior change was coded as Follow/Neutral (FN). Client behavior counts were also used to calculate summary scores (see Table 1).

The global and summary score ICCs from the double-coded sessions are presented in Table 1. Of the counselor global scores, MI Spirit had an ICC in the good range, while Acceptance and Empathy were below the acceptable cut-off of >.40. Out of 8, five of the counselor summary scores, including MICO, had excellent inter-rater reliability. MIIN, which occurred infrequently, had a poor ICC. Finally, the ICCs of all client summary scores were in the good to excellent range, while the ICC for the client global score, Self-Exploration, was poor.

Descriptives for the counselor and client global and summary scores are presented by intervention group in Table 1. The means of the summary scores were calculated for the entire session. These summary scores can be used to indicate intervention fidelity (i.e., whether the study counselors were delivering MI or not). Levels of beginning proficiency and expert practice in MI have been pro-

Table 1
Means and ICCs of Counselor and Client Global and Summary Scores by Format

	Intervention format[a]				
	MIF (n = 30)		MIO (n = 30)		
MISC variables	*M*	*SD*	*M*	*SD*	ICC[b]
Counselor global scores					
Acceptance	4.43	0.82	4.93	0.74	−0.20
Empathy	4.63	1.25	5.03	1.03	0.40
MI spirit	4.20	1.19	4.63	1.10	0.67
Client global score					
Self-exploration	4.20	0.96	3.93	0.83	−0.06
Counselor summary scores					
Total reflections	86.90	31.49	79.13	27.75	0.92
Percent complex reflections	4.59	3.36	5.94	4.54	0.14
Total questions	39.70	13.49	34.67	10.98	0.98
Percent open questions	78.79	10.81	76.31	10.16	0.92
Reflections: questions	2.46	1.26	2.44	0.95	0.94
MI consistent	126.83	36.08	113.93	32.97	0.96
MI inconsistent	2.30	2.64	1.00	2.67	0.07
Percent MI consistent	98.26	1.63	99.30	1.63	0.37
Client summary scores					
Sustain talk	55.67	29.49	52.30	22.62	0.84
Change talk	96.47	48.22	85.73	34.87	0.87
Percent change talk	63.20	9.67	62.22	10.73	0.70

[a] MIF = Motivational interviewing with feedback; MIO = motivational interviewing only; MI = motivational interviewing. [b] ICC = intraclass correlation, computed for a subset of sessions (n = 16) coded by two coders.

posed based on scores from the MISC coding system (Miller, 2000). The applicable MISC thresholds of MI proficiency are 5 or greater on counselor global ratings, at least 50% Open Questions, 40% Complex Reflections, 80% MICO, and a Reflection to Question Ratio of at least 1:1. Table 1 shows that, with the exception of percent complex reflections, our study counselors met the summary score thresholds in the both the MIO and MIF sessions. Of the 3 global scores, the threshold was only met for MI Spirit in MIO. Despite being below the recommended levels in some areas, the global scores are comparable to those reported in several other clinical trials of MI (e.g., Catley et al., 2006; Miller, Yahne, Moyers, Martinez, & Pirritano, 2004).

Data Analysis Strategy

To address the problem of multiple outcomes, we used principle component analysis to create a composite drinking score consisting of drinks per week, peak BAC, and protective behaviors. At baseline, the correlation between drinks per week and peak BAC was .597; drinks per week and protective behaviors, −.382; and peak BAC and protective behaviors, −.388. The first component accounted for approximately 64% of the variance; factor loadings for drinks per week, peak BAC, and protective behaviors were .841, .844, and −.706, respectively. This component was used as a composite outcome variable. The coefficients from the principal component analysis of the baseline measures were applied to the unstandardized measures at the 3-month follow-up. A larger value for the composite variable is an indication of poorer outcome measures (i.e., greater peak BAC, greater drinks per week, and fewer protective behaviors).

To examine differences in MICO, MIIN, CT, and ST between the corresponding segments of the interventions, we used *t* tests (for MICO, CT, and ST) and the Mann-Whitney *U* test (for MIIN). To examine the relationship between counselor and client language within each group, we regressed counselor MICO and client FN on client CT and ST. We included FN as a covariate to control for extraneous variation that might occur between session segments and from more garrulous clients; we used FN rather than the length of the counseling session because FN is a measure of client talk alone, whereas session length is dependent on both the counselor and client. We did not include MIIN as a covariate because of its infrequent occurrence and low inter-rater reliability (see Results section). Finally, we used multilevel modeling (Hox, 2000; Raudenbush & Bryk, 2002) to determine the relationship between client language and client drinking outcome while accounting for nesting within counselor. All multilevel modeling was performed using HLM Version 6 (Raudenbush, Byrk, & Congdon, 2004). A 3-level model was used, with drinking outcomes in the first level nested within participants at the second level, nested within counselors at the third level. We estimated separate multilevel models for each group. Measures in the first level were the baseline and 3-month scores of the composite drinking measure. At the second level, FN, ST, and CT were entered. The model was unconditional at the third level. Finally, we tested for between-group differences using a multilevel model with the two groups combined. This analysis included the same outcome and covariates as the within-group tests, with the addition of group, group x ST, and group x CT interaction terms as effects of interest. For this test, we used the total scores summed across all the session segments. Mediation between therapist behavior, client behavior, and treatment outcomes was evaluated using a product of coefficients method (MacKinnon, Fritz, Williams, & Lockwood, 2007).

Results

The mean frequencies of the counselor and client summary scores for each group are presented by segment (Interview, Feedback, and Rulers) in Table 2. There were no significant differences between the two study formats in MICO and MIIN in the Interview and Rulers segments (because of the addition of the Feedback segment in MIF, we did not compare summary scores between the entire MIF and MIO sessions).

Relationship Between Counselor Language and Client Language

MICO was positively correlated with CT, ST, and FN in both MIF (CT: $r = .61$, $p < .001$; ST: $r = .42$, $p = .02$; FN: $r = .53$, $p = .003$) and MIO (CT: $r = .50$, $p = .005$; ST: $r = .53$, $p = .002$; FN: $r = .50$, $p = .005$). The associations between counselor and client language by intervention are presented in Table 3. When controlling for FN as a measure of client "talkativeness," MICO was positively associated with CT ($\beta = .409$, $p = .019$) in MIF, as well as with both CT ($\beta = .445$, $p = .028$) and ST ($\beta = .390$, $p = .038$) in MIO. Thus, greater MICO was associated with greater CT in both groups, but also with greater ST in MIO.

Relationship Between Feedback and Client Language

To examine the effects that receiving feedback might have on client language in subsequent segments, we compared the client language in the Rulers segments of the two formats. Because only MIF received feedback, any difference in client talk between the two formats during the Rulers segments should represent the effects of receiving the feedback. Table 2 shows that there was a significant difference in ST between the groups in the Rulers segment. ST was significantly lower in the Rulers segment of MIF than in the Rulers segment of MIO (MIF = 13.77; MIO = 20.47; $t(58) = -2.27$, $p = .027$). There was no difference in the amount of CT between the MIF and MIO Rulers segments.

Relationship Between Client Language and Drinking Outcomes

Table 4 shows the results of multilevel models examining the relationship between client language and changes in the composite drinking score from baseline to the 3 month follow-up. The sample for this model was slightly smaller because not all of the participants whose sessions were coded completed the 3 month follow-up assessment (MIF: $n = 29$, MIO: $n = 29$). FN was used as a covariate in the second level. In the MIF intervention, greater CT predicted better drinking outcomes ($\beta = -0.011$, $p = .017$) and greater ST predicted poorer drinking outcomes ($\beta = 0.029$, $p = .001$). Neither CT nor ST predicted the growth rate in drinking outcomes ($p = .306$ and .381, respectively). In the MIO intervention, neither CT nor ST predicted drinking outcomes or the growth rate in drinking outcomes. ST approached significance as a predictor of outcome ($\beta = .021$, $p = .058$) and CT approached significance as a predictor of change ($\beta = .003$, $p = .052$). When we tested for between-group differences, ST, Group, and the CT by Group interaction term significantly predicted the composite drinking score at 3 months (ST: $\beta = .023$, $p = .001$; Group: $\beta = .622$, $p = .024$; CT x Group: $\beta = .022$, $p = .006$). Group alone was a significant predictor of the growth rate in the composite drinking outcome measure ($\beta = .183$, $p = .017$). Within the MIF group, a mediation test of MICO, CT, and the 3-month composite using the PRODCLIN procedure (MacKinnon et al., 2007) did not reveal a significant effect (99% CI: −.008–.015]).

DISCUSSION

The study was designed to evaluate three questions related to the role of MI and feedback in influencing client talk and outcome. In particular: (1) What is the relationship between counselor language and client language? (2) Does the inclusion of a personalized feedback profile affect client language? (3) Does client language predict client drinking outcome? With regard the first question, we

Table 2
Mean Frequencies of Counselor and Client Summary Scores by Format and Segment

		Intervention format[a]				
		MIF		MIO		
Summary score	Segment	*M*	*SD*	*M*	*SD*	p[b]
MI consistent	Interview	59.93	19.61	67.93	21.22	.135
	Feedback	30.50	10.99			
	Rulers	36.40	18.22	46.00	22.12	.072
MI inconsistent	Interview	0.40	0.77	0.63	2.22	.596
	Feedback	1.23	1.17			
	Rulers	0.67	1.79	0.37	0.76	.960
Change talk	Interview	44.13	21.95	45.80	20.18	.761
	Feedback	17.17	16.73			
	Rulers	35.17	23.05	39.93	22.18	.418
Sustain talk	Interview	29.17	15.35	31.83	13.99	.485
	Feedback	12.73	11.02			
	Rulers	13.77	8.24	20.47	13.95	.027

[a] MIF = Motivational interviewing with feedback; MIO = Motivational interviewing only; MI = motivational interviewing. [b] The Student's *t* test was used for MI consistent, change talk, and sustain talk. The Mann–Whitney *U* test was used for MI inconsistent.

Table 3
Regression Analyses for Variables Predicting Change Talk and Sustain Talk

	MIF						MIO					
	Change talk			Sustain talk			Change talk			Sustain talk		
Predictor variable	B	*SE*	β	B	*SE*	β	B	*SE*	β	B	*SE*	β
Follow/neutral	.295	.129	.377*	.280	.082	.585**	.082	.144	.108	.141	.088	.287
MI consistent	.546	.220	.409*	.094	.140	.115	.470	.202	.445*	.267	.123	.390*

Note. MIF = Motivational interviewing with feedback; MIO = Motivational interviewing only; B = Unstandardized coefficient; *SE* = Standard Error; β = Standardized coefficient; MI = motivational interviewing.
* $p < .05$. ** $p < .01$.

found that after controlling for FN, greater MICO was related to greater CT (but not ST) in the MIF format. This is consistent with previous studies that suggest that MI tends to increase talk in support of change (Catley et al., 2006; Moyers et al., 2007). In the MIO condition, greater MICO was related to greater CT and ST. This suggests that many of the client centered MI skills, such as open questions, affirmations, and reflections, may encourage people to talk, but that the combination of MI and feedback may tip the balance towards CT. It is important to note the correlational nature of these relationships. Because the coding data was recorded and analyzed in aggregate in this section, we cannot be certain that a causal relationship exists. However, it does indicate, as discussed later, at an important relationship between MI and feedback.

In terms of the second question, we found that receipt of personalized feedback decreased the amount of subsequent ST relative to a group that did not receive feedback. This suggests an important relationship between feedback and ST, and again highlights a potential synergy between MI and feedback. As previously mentioned, most published clinical trials of MI have used the MIF format (Hettema et al., 2005), and the results of our parent trial bear out this special relationship. In fact, one of our coders invoked the "good cop, bad cop" metaphor to explain the synergy between MI and feedback. The feedback delivers difficult information, whereas the MI style allows the counselor to maintain a neutral, facilitative tone. Like other MI/feedback studies, our feedback contained a mix of information including quantity/frequency of drinking, negative consequences, risk factors, and normative comparisons. Because client language was aggregated over the feedback section, it is impossible to determine whether certain feedback elements were more associated with positive talk. Future studies might consider coding language sequentially across feedback items to determine whether some items are more likely to produce positive talk. This would assist future interventions in developing more parsimonious feedback profiles, as well as suggest items for MI counselors to emphasize. Finally, there may be other explanations for the reduction in ST we observed. For instance, it may be that receiving feedback simply increases the amount of time spent with the counselor or time contemplating change, leading to less sustain talk towards the end of the session. Alternatively, our MI delivery may have varied from past studies or our participants may have been particularly receptive to feedback.

With regard to the third question, we found that greater ST predicted poorer 3-month drinking outcomes and greater CT predicted more positive 3-month drinking outcomes in the MIF group. Client language did not predict drinking outcome in the MIO group. When we examined data from our 6-month follow-up, results were similar to the 3-month follow-up. The relationship between client language and drinking outcomes in MIF are consistent with previous research (Amrhein et al., 2003; Gaume et al., 2008; Moyers et al., 2007); however, the lack of these relationships in MIO was surprising. In addition, we found only partial support for our mediation model in the MIF group; we found an effect of

Table 4
Multilevel Model for Variables Predicting Drinking Outcomes

	MIF			MIO		
Predictor	β	*SE*	*t*	β	*SE*	*T*
Intercept of composite						
Follow/neutral	−.003	.004	−0.798	.003	.005	0.638
Sustain talk (ST)	.029	.007	4.043***	.021	.010	1.980
Change talk (CT)	−.011	.004	−2.549*	.008	.006	1.313
Slope of composite						
Follow/neutral	.000	.001	0.121	−.001	.001	−0.822
Sustain talk (ST)	.002	.003	0.885	.001	.002	0.371
Change talk (CT)	−.002	.002	−1.036	.003	.001	1.983

Note. MIF = Motivational interviewing with feedback; MIO = motivational interviewing only; β = Standardized coefficient; *SE* = Standard Error; MI = motivational interviewing; *t* = t ratio.
* $p < .05$. *** $p < .001$.

counselor speech on client speech, and client speech on client outcome, but did not find that client speech mediated the relationship between counselor speech and client outcome. Although we did not find full support for the hypothesized causal chain of MI (Miller & Rose, 2009), it is also possible that our lack of results might be partially attributed other factors, such as measurement or sample limitations. For instance, some research has suggested that more general counselor interpersonal skills, such as empathy, which are more difficult to measure may account for more of a client's response than specific clinical techniques (Moyers, Miller, & Hendrickson, 2005). It is also possible that the feedback, in addition to facilitating the counselor's MI skills, was eliciting its own independent effect. This would be consistent with the results of the parent trial, which showed that only MIF reduced drinking. Unfortunately, the design of our study does not allow us to determine the extent to which feedback exerted its own effect on client language or drinking outcome. Finally, the uniqueness of our sample may have contributed to our lack of mediation findings. In contrast to most past studies, which have examined language patterns among adults, our sample consisted of college students who may have unique language outcomes. Indeed, others have commented that college students are far less likely to verbalize their intentions to change drinking (Walters & Baer, 2006), and one study of adolescent language found that some key aspects of change talk were unrelated to changes in drinking (Baer et al., 2008).

Our study was strengthened by the use of a randomized design and rigorous coding procedures. Counselor scores indicated that MI was delivered adequately in both conditions. The study was limited in that we could not blind counselors or coders to condition. The ICCs for some behavior categories were poor, limiting their use in our analyses. The ICCs for some global ratings were also low, but this appears to have been the result of restriction of range, which attenuates the values of ICCs (Saal, Downey, & Lahey, 1980). In addition, because of the inclusion of personalized feedback in the MIF condition, there was a significant time difference between the two conditions. However, there were no significant differences in length between the common sections, nor did session length predict drinking outcome. Finally, because the study was designed to evaluate an MI intervention, we were able to identify very few instances of MI inconsistent behaviors. This restricted range limited our ability to detect an effect of MIIN and may prevent our results from generalizing well to other kinds of intervention approaches in which the counselors are not highly trained in MI.

This study adds to the growing body of literature that supports a relationship between counselor and client language, and between client language and outcomes. Admittedly, our results offer a better picture of what is happening during MIF sessions than during MIO sessions. In MIF sessions, we found that MI consistent language was related to CT, personalized feedback led to a decrease in ST, and client CT and ST predicted drinking outcomes in the expected directions. In general, MI appeared to be working as expected when MI was combined with a personalized feedback profile. However, we did not see the same path in the MIO, where better MI led to increased levels of CT as well as ST talk. This may suggest that many of MI's client-centered properties were actively facilitating exploration of change, without causing clients to resolve their ambivalence in the direction of change. Combined with the results of the parent project, where only MIF significantly reduced drinking over assessment, these findings boost the credibility of MIF in a college setting, as well as raise questions about the effectiveness of MI when delivered without a personalized feedback profile. It is unclear, however, to what extent these results might generalize to other populations beyond college drinkers; in fact, there is a substantial evidence base for stand-alone feedback in college populations (Walters & Neighbors, 2005), and some feedback items, such as normative drinking information, may be particularly salient to college drinkers, even outside of a therapeutic counseling session. Nonetheless, the results of this study strengthen the case for incorporating personalized feedback in future research and real-world implementations with college students and other populations.

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