Does readiness to change predict in-session motivational language? Correspondence between two conceptualizations of client motivation

Kevin A. Hallgren and **Theresa B. Moyers**
Center on Alcoholism, Substance Abuse and Addictions, 2650 Yale Blvd SE, University of New Mexico, Albuquerque, NM 87106

Abstract

Aims—Client language reflecting motivation for changing substance use (i.e., change talk) has been shown to predict outcomes in motivational interviewing. While previous work has shown that change talk may be elicited by clinician behaviors, little is known about intrapersonal factors that may elicit change talk, including clients' baseline motivation for change. The present study tested whether in-session change talk differs between clients based on their readiness for change.

Design and Setting—First-session audio recordings from Project MATCH, a large multisite clinical trial of alcohol treatments.

Participants—Project MATCH outpatients ($N = 69$) and aftercare patients ($N = 48$) receiving Motivational Enhancement Therapy (MET).

Measurements—Client language from first-session MET was coded using the Sequential Code for Observing Process Exchanges. Readiness and stages of change were assessed using both categorical and dimensional variables derived from the University of Rhode Island Change Assessment and the Stages of Change Readiness and Treatment Eagerness Scale, administered prior to first treatment sessions.

Findings—Stage of change scales followed some of the expected correspondence with change talk, although the associations were generally small in magnitude and inconsistent across measures and treatment arms. Higher overall readiness did not predict more overall change talk, contemplation had mixed associations with preparatory change talk, and preparation/action did not predict commitment language.

Conclusions—Motivational language used in initial sessions by people receiving counselling for excessive alcohol consumption does not appear to be associated with readiness to change as construed by the Transtheoretical Model.

Keywords

alcohol; client change talk; motivation; motivational interviewing; transtheoretical model

Introduction

One method for evaluating client motivation within treatment sessions involves the analysis of in-session language. Broadly, client language can express motivation for changing

Correspondence to: Kevin A. Hallgren, Center on Alcoholism, Substance Abuse, and Addictions, University of New Mexico. 2650 Yale Blvd SE, Albuquerque, NM. khallg@unm.edu.

("change talk") or sustaining ("sustain talk") substance-use behavior. The increasing strength and frequency of change talk within an empathetic environment is hypothesized to be an active mechanism of change in Motivational Interviewing (MI), rather than an inert marker for motivation [1, 2]. Miller and Rollnick [3] hypothesized that through clients' verbal expression of change talk, belief in those statements is strengthened. In other words, by hearing oneself speak in favor of change, one is more likely to believe in the benefits of change and to follow through with verbal commitments to make changes [2, 4]. Miller and Rose [1] outlined a causal chain hypothesis whereby clinician empathy and MI-consistent techniques lead to preparatory change talk, and preparatory change talk in turn leads to verbal commitments to change, then finally behavior change. Substance abuse treatment research has provided preliminary support for the hypothesis that change talk is a mechanism of change [2, 5, 6].

Change talk and sustain talk can be expressed in statements describing emotions or beliefs about changing, commitments to changing, or actions taken toward changing. Language that describes emotions or beliefs about changing substance-use behavior is commonly expressed as desire, ability, reasons, or need for change, which are considered forms of preparatory change talk [7]. Qualitatively different from such preparatory change talk [4] is client speech that expresses intent or obligation to change behavior, which is termed commitment language. Motivation may also be expressed as taking steps change talk, which describes specific actions a client has taken to facilitate change.

The Transtheoretical Model of Change (TTM) posits that the process of changing addictive behaviors is marked by movement through discrete stages of change [8]. In each of these stages, motivation for change is expected to differ in quality of expression (e.g., exploring pros and cons of changing vs. making a commitment to change) and in the quantity of motivation (i.e., motivation strength increases as one progresses through stages). These stages of change are also marked by specific tasks such as analyzing reasons for changing, increasing commitment for change, or implementing actual behavioral change [8]. From a framework guided by the TTM, it would seem logical to deduce that clients' verbally expressed motivation for change (i.e., change talk) would vary across stages; however, no studies to date have evaluated whether TTM stages are associated with the quantity or quality of change talk. If the TTM stages represent a true progression in motivation to change, one should expect to see qualitative and quantitative differences in motivational language from clients in different stages. If such differences were found, this could provide useful feedback for clinicians implementing MI. If, for example, pre-treatment assessment of readiness to change were to correspond closely to subsequent client language during treatment sessions, this might mean that clinicians could apportion relatively little attention to moment-by-moment analysis of what the client is saying within the treatment session to tailor interventions. Instead, they could rely on the client's assessed readiness to change to select and implement treatment interventions.

The goal of the present study is to test whether differences in readiness to change reflect differences in both the *amount* of change talk expressed in therapy sessions and in the *types* of change talk expressed. In general, we expected the strength and frequency of change talk to increase corresponding to the client's assessed level of readiness within the stages of change model. Specifically, we tested the hypotheses that: (1) greater readiness for change would correspond with higher levels of in-session change talk, (2) contemplation would be associated with higher frequency of preparatory change talk (i.e., desire, ability, reason, and need language), and (3) preparation/action would be associated with more frequent commitment and taking steps change talk.

Method

Participants

First-session Motivational Enhancement Therapy sessions were reviewed from 117 participants in Project MATCH [9]. Full characteristics of this sample are provided elsewhere [2]. Participants were selected from both outpatient ($n = 69$) and aftercare ($n = 48$) treatment arms, with aftercare patients typically being more alcohol dependent than outpatients [9].

Measures

The Sequential Code for Observing Process Exchanges (SCOPE)—Audio recordings of Motivational Enhancement Therapy (MET) sessions were transcribed and coded in two passes using the SCOPE [10]. Client statements expressing motivation to decrease alcohol use were coded as change talk, while utterances expressing motivation to maintain alcohol use were coded as sustain talk (also called "counter-change talk").

Change talk utterances were further classified based on the type of motivation they reflected. These could be coded as preparatory language, including desire (e.g., "I want to stop drinking"), ability (e.g., "I am capable of quitting drinking"), reason (e.g., "I may lose custody of my kids if I continue drinking"), or need (e.g., "I need to stop drinking") for change; commitment for change (e.g., "I'm going to throw away all my alcohol tonight"), or taking steps toward change (e.g., "I started taking a different route home from work that avoids the bar"); or "other" type of motivation for change (e.g., "I sure want to get the most out of this therapy"). Inter-rater reliability estimates for each of these variables were mostly in the good to excellent range (intraclass correlation range = .59 to .93).

University of Rhode Island Change Assessment Scale (URICA)—The URICA [11] was administered before participants' first MET session to assess motivational readiness to change. The URICA yields three outcome variables of interest for the present study, including (1) a continuous scale representing overall readiness for change ($M = 10.72$, $SD = 1.62$, possible scores range from -2 to +14); (2) a categorical variable designating low, medium, or high readiness for change roughly approximating the precontemplation, contemplation, or preparation/action stages of change, respectively, based on trichotomization of the readiness for change score [12]; and (3) four continuous subscales (possible scores range from 1 to 5) representing four of the five TTM stages of change: precontemplation ($M = 1.74$, $SD = 0.58$), contemplation ($M = 4.42$, $SD = 0.46$), action ($M = 4.21$, $SD = 0.48$), and maintenance ($M = 3.83$, $SD = 0.68$). The URICA has been shown to have acceptable internal consistency [13,14]; however, the test-retest reliability has not been evaluated rigorously [15] and correspondence with other self-report measures of motivation for change has been mixed [16,17]. Time durations between questionnaire assessments and first MET sessions were variable and typically longer in duration for aftercare patients than outpatients.

Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES)—The SOCRATES 5.0 [18] is a 20-item self-report questionnaire assessing readiness for changing alcohol use. Empirically derived factors from the SOCRATES provide subscales for recognition, which is derived from items representing precontemplation and determination in the TTM; taking steps, which maps onto items reflecting action and maintenance; and ambivalence, which characterizes contemplation. These factors have good reported internal consistency [18].

Data Analysis Plan

Client change talk variable—Frequencies for each type of client utterance were converted to percentage scores to reflect the frequency of each change talk category relative to the overall frequency of change talk and sustain talk. Percentage scores were calculated by dividing the frequency of the language category by the total number of motivational utterances (change talk + sustain talk). Each percentage score represents the proportion of participants' motivational language that was devoted to a specific category coded with the SCOPE. To reduce violations of normality within the distributions, percentage scores were transformed using arcsine square root transformations [19], which were used in all subsequent statistical analyses except for descriptive statistics (see Table 1).

Analyses—Because the readiness to change instruments were given at different time points in the treatment process for Project MATCH (i.e., outpatients received them at the beginning of treatment, whereas the aftercare patients received them between inpatient or intensive outpatient treatment and aftercare treatment), the two arms were analyzed separately.

To test whether change talk differed across stages of change, we used between-subjects ANOVAs to test for differences in overall change talk across levels of readiness. To test for differences in subcategories of change talk and sustain talk across levels of readiness, we used MANOVAs with Wilks' Lambda criteria by entering each change talk subcategory as a dependent variable and the categorical readiness for change variable as the between-subjects predictor. Follow-up univariate ANOVAs were examined to determine whether preparatory and action change talk differed across stages as predicted by our hypotheses.

To look more closely at the pattern of relationships between readiness and change talk, we generated correlation matrices for change talk, sustain talk, and subscales of the URICA and SOCRATES. Correlations between the URICA and SOCRATES subscales and subcategories of client language for both arms were examined using two-tailed Pearson correlation tests.

Because change talk may be quantified in many ways, analyses were repeated using two alternative formulas for quantifying change talk. The first alternative quantified each percentage score by adding follow/neutral statements to the denominator (i.e., dividing each change talk category by change talk + sustain talk + follow and neutral statements). The resulting variable for each language category may be conceptualized as the frequency of the language category relative to *all* client statements given in the session, which was then arcsine square root transformed to reduce violations of normality. The second formula quantified change talk in terms of raw frequencies rather than proportions, which were then square root transformed. Discrepancies between the three methods for quantifying change talk were examined and are commented on below.

Responses to missing items from the URICA and SOCRATES were imputed based on the mean score of the subscale from which the item was missing. Subscales with greater than two items missing were not computed for analyses.

Results

Hypothesis 1: Clients with lower readiness for change will give less change talk than clients with higher readiness for change. Change talk will positively correlate with problem recognition and negatively correlate with precontemplation

One-way ANOVAs on change talk demonstrated a significant difference in the proportion of change talk between stages of change for the outpatient arm, $F(2,66) = 3.60$, $p = .03$, but not

the aftercare arm, $F(2,45) = .22$, $p = .80$. Contrary to our hypothesis, follow-up contrasts for outpatients revealed that change talk did not follow a linear trend across stages, $t(66) = -.99$, $p = .33$, but instead followed a negative quadratic trend, $t(66) = -2.51$, $p = .015$, which indicated that outpatients in the contemplation stage had higher percentages of change talk than participants in other stages.

Correlations between URICA subscales and percentage of overall change talk were not significant (see Table 2). The recognition scale of the SOCRATES was correlated with overall change talk for the aftercare arm, but not the outpatient arm (see Table 3).

Hypothesis 2: Preparatory change talk will be greater in the contemplation stage of change

One-way between-subjects MANOVAs with preparatory change talk subcategories (desire, ability, reason, and need) as the dependent variables resulted in a significant multivariate effect between groups within the outpatient arm, $F(8,126) = 2.58$, $p = .01$, but not the within the aftercare arm, $F(8,84) = 1.13$, $p = .35$. Univariate testing of preparatory language subcategories showed that the significant group difference for outpatients was specific to reason change talk, but not to desire, ability, or need change talk (see Table 4). Follow-up contrasts revealed a significant negative quadratic trend for reason change talk between readiness levels within the outpatient arm $t(66) = -2.86$, $p < .001$, which supported the hypothesis that participants in the contemplation stage would have higher reason change talk than participants in the other stages.

In the correlation analyses, the contemplation subscale of the URICA was not significantly correlated with desire, ability, reason, or need change talk, or with any other change talk categories (see Table 2) for either treatment arm. Contrary to our hypothesis, the ambivalence scale of the SOCRATES was negatively correlated with reason change talk for the outpatient arm, and was unrelated to any preparatory change talk categories for the aftercare arm (see Table 3).

Hypothesis 3: Commitment and taking steps change talk will be greater in the preparation/action stages of change

One-way between-subjects MANOVAs were performed with commitment and taking steps change talk as dependent variables and did not yield the expected multivariate difference between the three stages for both the outpatient arm, $F(4,132) = 0.95$, $p = .44$, and the aftercare arm, $F(4,88) = 0.11$, $p = .98$.

Correlation tests revealed that the action and maintenance subscales of the URICA were not significantly related to commitment or taking steps language for either treatment arm (see Table 2). The taking steps scale of the SOCRATES was not correlated with taking steps or commitment change talk for the outpatient arm, but was positively correlated with taking steps change talk for the aftercare arm (see Table 3).

Exploratory analysis of sustain talk subcategories

One-way between-subjects MANOVAs were performed with each of the sustain talk subcategories as dependent variables and stage of change as the independent variable for both treatment arms. The omnibus test resulted in a significant multivariate effect for the sustain talk variables between groups for the outpatient arm, $F(12,122) = 2.73$, $p = .003$, but not for the aftercare arm, $F(12, 80) = 1.08$, $p = .39$. Univariate testing showed that this difference was specific to ability sustain talk, but not desire, reason, need, commitment, or taking steps (see Table 4). Follow-up contrasts revealed a positive linear effect for ability sustain talk across readiness levels within the outpatient arm, $t(66) = 3.44$, $p = .001$,

indicating that clients with higher readiness for change gave more ability sustain talk (i.e., statements about perceived inability to change).

Reanalysis with different change and sustain talk indices

Because change talk may be quantified in many ways, the preceding analyses were repeated with two new indices for each client language variable, (1) by including follow/neutral statements in the denominator (i.e., dividing each language category by change talk + sustain talk + follow/neutral) with arcsine square root transformations, and (2) by using the raw frequencies of each category with square root transformations. The results from these analyses are largely redundant with the analyses reported above, with a few small discrepancies that could alter interpretation of the results. First, change talk percentage scores computed with follow/neutral statements in the denominator failed to produce a significant omnibus MANOVA for preparatory language, although this analysis did yield a significant univariate effect for reason change talk similar to the results above. Second, raw frequencies of change talk did not produce any significant MANOVAs or a significant univariate effect for reason change talk, and only produced a significant univariate effect for ability sustain talk similar to the results above. Each of the significant correlations for change talk and sustain talk with URICA and SOCRATES subscales was replicated either by one or both of the alternative methods for quantifying change talk, and non-significant replicates mostly retained marginal significance ($p < .10$), which suggests that these correlational findings were fairly robust across computation methods.

Power Analysis

A power analysis was conducted *post hoc* using GPower [20] to determine the effect sizes that would likely be detectable given the current sample size. Results suggest that for outpatients, the ANOVAs and MANOVAs in the present study would be capable of detecting effect sizes of $f^2 = .15$ and $f^2 = .12$, respectively, and $f^2 = .21$ and $f^2 = .17$ for aftercare patients with .80 power at an alpha level of .05 (two-tailed) without correction for multiple significance testing. The correlational analyses were powered to detect effect sizes of $|r| > .24$ for outpatients and $|r| > .29$ for aftercare patients. The samples were powered to detect medium effect sizes, and it is possible that some of the lack of significant findings could be due to being under-powered if effect sizes are small.

Discussion

Our study failed to find any consistent associations between self-reported motivation at the beginning of treatment and subsequent client change talk within MET sessions. The overarching inconsistency across samples and measures suggests that, although these two constructs may be related, in-session motivational language is unlikely to be reliably predicted from self-reported motivation. Taken with previous work that has failed to find that readiness to change predicted outcomes [21,22], these results suggest that further work is needed to better understand the construct of readiness to change, especially as it relates to client behavior during treatment sessions.

Our results indicate that readiness to change and change talk probably represent two separate constructs that each capture some dimension of client motivation. Readiness to change and change talk should both be explored by clinicians, and neither should be used as a substitute for the other. Both measures of motivation predicted drinking outcomes in Project MATCH [2,10,23], and although there was some association between these two measures, it was often inconsistent, suggesting that change talk is not just a substitute for readiness for change. Also, when significant, the magnitude of the association between change talk variables and self-reported motivation was relatively small. If these are two related but

separate constructs, it is possible that they are causally linked. For example it is possible that one precedes the other such that contemplation provokes more change talk or sustain talk, or conversely that the particular language evoked from clients in a treatment session may influence their readiness to change. Future research directed toward identifying causal mechanisms of change in psychosocial treatments for substance abuse may shed light on this relationship.

Our results also indicate that clinicians using treatment approaches that individualize interventions to the client's level of motivation should not rely solely on a pre-treatment assessment such as the SOCRATES or URICA. Clients with scores on these instruments that indicate high readiness to change may still be offering a substantial amount of sustain talk during treatment sessions that should serve as a signal to avoid direction, advice-giving, and teaching, as these clinician behaviors predict increased client resistance and poorer outcomes [24-27]. Instead, client language that suggests ambivalence or low motivation for change could cue the clinician to focus on alliance building or reviewing reasons for change, which could be expected to improve treatment outcomes, rather than pursue more directive strategies [9,28,29]. Our data indicate that the careful in-session monitoring of such language, and subsequent on-the-fly tailoring of interventions, cannot be replaced by a pre-treatment measure of readiness to change. In particular, decisions about whether or not to implement a change plan should be made with careful consideration of the client's change talk during the treatment session [4,30,31].

There are several limitations of the present study that should be addressed. The present study only analyzed client language from first-sessions of MET, thus limiting the generalizability of the results to other treatments and to later sessions of MET. While it is possible that client motivational language may mediate outcomes and be influenced by clinicians for a variety of treatment modalities [32], these relationships have been explored most extensively in treatments based on Motivation Interviewing [c.f., 5]. Further, because MET therapists aim to increase client change talk, our inability to detect how much change talk clients would naturally offer outside of this context is limited. An additional limitation is that several of the change talk categories occurred at relatively low rates. For example, commitment and taking steps change talk occurred much less frequently than preparatory change talk, which may have limited the ability to detect significant relationships between TTM stages and some categories of change talk. Notably, despite the low base rates of these language categories, the independent raters in this study were able to identify these types of statements reliably. Additionally, our measure of change talk and sustain talk, the SCOPE, counted frequencies of each behavior but did not quantify the strength of each statement as has been done in some studies [5,6], and thus measures of strength may have yielded a different pattern of results.

Finally, readiness to change as assessed by the paper and pencil measures in this study was not measured at the same time that the treatment session was conducted. Thus, it is possible that the clients' readiness had changed over time prior to the first treatment session without being detected. For example, readiness could had changed between baseline assessment and clinical sessions due to assessment reactivity [33,34]. Such undetected changes in readiness would obscure our ability to detect relationships between our variables.

Overall, these data support a model of client motivation to change substance use as a complex, multifaceted construct. Information about the ways in which client language and the client's readiness to change might interact would allow clinicians to make specific treatment decisions, such as whether or not to make a change plan [30,31], in real time as the treatment is offered. Such tailoring of treatment, done by assessing in-treatment process

measures, represents a potential way to increase the efficiency and efficacy of behavioral treatments for addictions.

Acknowledgments

References

1. Miller WR, Rose GS. Toward a theory of motivational interviewing. Am Psychol. 2009; 64(6):527–37. [PubMed: 19739882]

2. Moyers TB, Martin T, Houck JM, Christopher PJ, Tonigan JS. From in-session behaviors to drinking outcomes: a causal chain for Motivational Interviewing. J Consult Clin Psychol. 2009; 77(6):1113–24. [PubMed: 19968387]

3. Miller, WR.; Rollnick, S. Motivational Interviewing: preparing people for change. 2nd. New York: Guilford; 2002.

4. Amrhein PC. How does Motivational Interviewing work? What client talk reveals. J Cogn Psychother. 2004; 18(4):323–36.

5. Aharonovich E, Amrhein PC, Bisaga A, Nunes EV, Hasin DS. Cognition, commitment language, and behavioral change among cocaine-dependent patients. Psychol Addict Behav. 2008; 22:557–62. [PubMed: 19071981]

6. Amrhein PC, Miller WR, Yahne CE, Palmer M, Fulcher L. Client commitment language during motivational interviewing predicts drug use outcomes. J Consult Clin Psychol. 2003; 71(5):862–78. [PubMed: 14516235]

7. Miller WR, Moyers TB, Amrhein P, Rollnick S. A consensus statement on defining change talk. Motivational Interviewing Network of Trainers Bulletin. 2006; 13(2):6–7.

8. DiClemente, CC. Addiction and change: how addictions develop and addicted people recover. New York: Guilford; 2006. 2006.

9. Project MATCH Research Group. Matching alcoholism treatments to client heterogeneity: Project MATCH posttreatment drinking outcomes. J Stud Alcohol. 1997; 58(1):7–29. [PubMed: 8979210]

10. Martin, T.; Moyers, TB.; Houck, J.; Christopher, P.; Miller, WR. Motivational Interviewing Sequential Code for Observing Process Exchanges (MI-SCOPE) coder's manual. University of New Mexico Center on Alcoholism, Substance Abuse, and Addictions. 2005. Available from: http://casaa.unm.edu/download/scope.pdf

11. DiClemente CC, Hughes SO. Stages of change profiles in outpatient alcoholism treatment. J Subst Abuse. 1990; 2(2):217–35. [PubMed: 2136111]

12. DiClemente, CC.; Carbonari, JP.; Zweben, A.; Morrel, T.; Lee, RE. Motivation hypothesis causal chain analysis. In: Longabaugh, R.; Wirtz, PW., editors. Project MATCH: Hypotheses, results, and causal chain analysis. Maryland: National Institute on Alcohol Abuse and Alcoholism; 2001. p. 206-23.NIH Publication

13. McConnaughy EA, DiClemente CC, Prochaska JO, Velicer WF. Stages of change in psychotherapy: a follow-up report. Psychother Theory Res Pract Train. 1989; 26(4):494–503.

14. McConnaughy EA, Prochaska JO, Velicer WF. Stages of change in psychotherapy: measurement and sample profiles. Psychother Theory Res Pract. 1983; 20(3):368–75.

15. Carey KB, Purnine DM, Maisto SA, Carey MP. Assessing readiness to change substance abuse: a critical review of instruments. Clin Psychol Sci Pract. 1999; 6(3):245–66.

16. Amodei N, Lamb RJ. Convergent and concurrent validity of the Contemplation Ladder and URICA scales. Drug Alcohol Depend. 2004; 73(3):301–6. [PubMed: 15036552]

17. Napper LE, Wood MM, Jaffe A, Fisher DG, Reynolds GL, Klahn JA. Convergent and discriminant validity of three measures of stage of change. Psychol Addict Behav. 2008; 22(3):362–71. [PubMed: 18778129]

18. Miller WR, Tonigan JS. Assessing drinkers' motivations for change: The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES). Psychol Addict Behav. 1996; 10(2):81–9.

19. Fink EL. The FAQs on data transformation. Commun Monogr. 2009; 76(4):379–97.

20. Erdfelder E, Faul F, Buchner A. GPOWER: A general power analysis program. Behav Res Methods Instrum Comput. 1996; 28(1):1–11.

21. Gossop M, Stewart D, Marsden J. Readiness for change and drug use outcomes after treatment. Addiction. 2007; 102(2):301–8. [PubMed: 17222285]

22. Collins SE, Logan DE, Neighbors C. Which came first: The readiness or the change? Longitudinal relationships between readiness to change and drinking among college drinkers. Addiction. 2010; 105(11):1899–909. [PubMed: 20854333]

23. Project MATCH Research Group. Matching Alcoholism Treatments to Client Heterogeneity: Project MATCH three-year drinking outcomes. Alcohol Clin Exper Res. 1998; 22(6):1300–11. [PubMed: 9756046]

24. Miller WR, Benefield RG, Tonigan JS. Enhancing motivation for change in problem drinking: a controlled comparison of two therapist styles. J Consult Clin Psychol. 1993; 61(3):455–61. [PubMed: 8326047]

25. Boardman T, Catley D, Grobe JE, Little TD, Ahluwalia JS. Using motivational interviewing with smokers: do therapist behaviors relate to engagement and therapeutic alliance? J Subst Abuse Treat. 2006; 31(4):329–39. [PubMed: 17084786]

26. Moyers TB, Miller WR, Hendrickson SML. How does motivational interviewing work? Therapist interpersonal skill predicts client involvement within motivational interviewing sessions. J Consult Clin Psychol. 2005; 73(4):590–8. [PubMed: 16173846]

27. 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? Alcohol Clin Exper Res. 2007; 31(3s):40s–7s. [PubMed: 17880345]

28. Karno MP, Longabaugh R. Less directiveness by therapists improves drinking outcomes of reactant clients in alcoholism treatment. J Consult Clin Psychol. 2005; 73(2):262–7. [PubMed: 15796633]

29. Karno MP, Longabaugh R, Herbeck D. Patient reactance as a moderator of the effect of therapist structure on posttreatment alcohol use. J Stud Alcohol Drug. 2009; 70(6):929–36.

30. Lee CS, Baird J, Longabaugh R, Nirenberg TD, Mello MJ, Woolard R. Change plan as an active ingredient of brief motivational interventions for reducing negative consequences of drinking in hazardous drinking emergency-department patients. J Stud Alcohol Drug. 2010; 71(5):726–33.

31. Magill M, Apodaca TR, Barnett NP, Monti PM. The route to change: Within-session predictors of change plan completion in a motivational interview. J Subst Abuse Treat. 2010; 38(3):299–305. [PubMed: 20149571]

32. Moyers TB, Martin T. Therapist influence on client language during motivational interviewing sessions. J Subst Abus Treat. 2006; 30(3):245–51.

33. Clifford PR, Maisto SA. Subject reactivity effects and alcohol treatment outcome research. J Stud Alcohol. 2000; 61(6):787–93. [PubMed: 11188483]

34. Walters ST, Vader AM, Harris TR, Jouriles EN. Reactivity to alcohol assessment measures: an experimental test. Addiction. 2009; 104(8):1305–10. [PubMed: 19624323]

Table 1

Client Language Percentage Scores for Full Sample and by Group

Change talk category	Stage of Change group							
Outpatient arm	Full Arm (*n* = 69)		Low Readiness (*n* =24)		Medium Readiness (*n* =22)		High Readiness (*n* =23)	
	M	(SD)	M	(SD)	M	(SD)	M	(SD)
Change talk (total)	.739	(.130)	.726	(.135)	.792	(.105)	.694	(.130)
Desire	.041	(.046)	.037	(.031)	.056	(.066)	.034	(.032)
Ability	.025	(.031)	.022	(.032)	.017	(.015)	.036	(.038)
Reason	.318	(.136)	.299	(.121)	.404	(.116)	.251	(.130)
Need	.018	(.024)	.017	(.023)	.024	(.032)	.013	(.014)
Commitment	.098	(.067)	.102	(.070)	.079	(.061)	.112	(.070)
Taking Steps	.041	(.047)	.040	(.046)	.044	(.045)	.038	(.052)
Other	.198	(.095)	.209	(.100)	.168	(.090)	.210	(.091)
Sustain talk (total)	.261	(.130)	.274	(.139)	.208	(.105)	.306	(.130)
Desire	.010	(.019)	.006	(.012)	.015	(.027)	.009	(.018)
Ability	.046	(.048)	.033	(.042)	.033	(.036)	.074	(.054)
Reason	.115	(.081)	.133	(.086)	.099	(.081)	.116	(.077)
Need	.005	(.010)	.005	(.011)	.002	(.007)	.008	(.011)
Commitment	.040	(.041)	.036	(.039)	.034	(.038)	.051	(.044)
Taking Steps	.002	(.006)	.002	(.006)	.000	(.002)	.002	(.008)
Other	.044	(.043)	.060	(.064)	.026	(.034)	.047	(.053)
Aftercare arm	Full Arm (*n* = 48)		Low Readiness (*n* = 15)		Medium Readiness (*n* = 18)		High Readiness (*n* =15)	
	M	(SD)	M	(SD)	M	(SD)	M	(SD)
Change talk (total)	.781	(.123)	.773	(.127)	.777	(.106)	.793	(.154)
Desire	.039	(.030)	.037	(.028)	.037	(.032)	.042	(.031)
Ability	.029	(.028)	.016	(.020)	.032	(.031)	.037	(.027)
Reason	.359	(.116)	.407	(.148)	.360	(.934)	.310	(.088)
Need	.017	(.026)	.016	(.018)	.014	(.019)	.023	(.037)
Commitment	.114	(.070)	.108	(.057)	.117	(.069)	.116	(.086)

Change talk category	Stage of Change group							
	Full Arm (n = 69)		Low Readiness (n =24)		Medium Readiness (n =22)		High Readiness (n =23)	
Outpatient arm	M	(SD)	M	(SD)	M	(SD)	M	(SD)
Taking Steps	.022	(.025)	.021	(.029)	.023	(.026)	.023	(.022)
Other	.201	(.081)	.168	(.073)	.195	(.070)	.242	(.089)
Sustain talk (total)	.219	(.123)	.227	(.127)	.223	(.106)	.207	(.144)
Desire	.014	(.025)	.024	(.032)	.008	(.012)	.010	(.027)
Ability	.031	(.034)	.021	(.024)	.034	(.032)	.040	(.044)
Reason	.103	(.079)	.112	(.078)	.104	(.080)	.092	(.083)
Need	.005	(.013)	.003	(.008)	.005	(.009)	.006	(.019)
Commitment	.034	(.034)	.037	(.037)	.033	(.037)	.034	(.033)
Taking Steps	.007	(.020)	.002	(.006)	.012	(.026)	.005	(.019)
Other	.025	(.031)	.029	(.031)	.027	(.034)	.020	(.029)

Note. Means and standard deviations are presented as untransformed percentage scores.

Table 2

URICA Subscale Correlations with Change Talk and Sustain Talk for Outpatients and Aftercare Patients

| | URICA Subscale | | | | | | | | | |
| | Outpatients | | | | | Aftercare | | | | |
	Precontem-plation	Contem-plation	Action	Maintenance	Readiness	Precontem-plation	Contem-plation	Action	Maintenance	Readiness
Change Talk										
Desire	-.11	.08	.08	-.07	.05	-.34*	.01	-.16	.00	.09
Ability	-.18	-.04	-.12	-.02	.01	-.40*	.03	.23	.15	.30*
Reason	-.14	.09	-.17	-.15	.06	.19	-.26	-.34*	-.13	-.32*
Need	-.15	-.01	-.06	-.03	.02	-.10	.11	-.05	.11	.11
Commitment	-.12	-.08	-.02	-.03	.00	.09	.01	.16	.06	.04
Taking Steps	-.02	-.02	-.01	-.08	-.03	-.17	.09	.19	-.17	.09
Total Change Talk	-.03	.05	.05	-.20	-.04	-.07	.06	.07	.20	.15
Sustain Talk										
Desire	-.01	-.02	.02	.14	.06	.17	-.23	-.30*	-.10	-.28
Ability	-.16	.16	.13	.32**	.27*	-.16	.19	.05	-.02	.14
Reason	.04	.00	-.07	.09	.01	.08	-.14	-.16	-.30*	-.25
Need	.03	.12	.13	.26	.17	-.06	-.04	.00	.02	.02
Commitment	-.21	.04	-.01	.13	.13	-.03	-.06	.19	-.03	.04
Taking Steps	-.01	.01	-.01	-.17	-.07	-.05	.19	.04	-.13	.04
Total Sustain Talk	.03	-.05	-.05	.20	.04	.07	-.06	-.07	-.20	-.15

Note.

*
$p < .05$,

**
$p < .01$.

URICA = University of Rhode Island Change Assessment.

Correlation coefficient magnitudes must be greater than .24 for Outpatients and greater than .29 for Aftercare to reach significance.

Table 3

SOCRATES Subscale Correlations with Change Talk and Sustain Talk for Outpatients and Aftercare Patients

| | SOCRATES Subscale | | | | | |
| | Outpatient Arm | | | Aftercare arm | | |
	Taking Steps	Recognition	Ambivalence	Taking Steps	Recognition	Ambivalence
Change Talk						
Desire	-.02	.07	.04	-.15	.02	.10
Ability	-.21	.00	.10	.34**	.22	-.01
Reason	.15	-.02	-.33**	-.25	-.07	.07
Need	-.08	.00	-.06	.05	.27	.07
Commitment	-.09	.00	.07	.06	.04	-.20
Taking Steps	-.03	-.03	-.12	.36*	.26	.04
Total Change Talk	.08	-.07	-.14	.10	.30*	.12
Sustain Talk						
Desire	.13	-.11	-.04	-.04	-.28	-.02
Ability	-.03	.34**	.08	.14	.17	.09
Reason	-.18	-.05	.12	-.08	-.29	-.12
Need	.07	.12	.07	-.04	.11	-.22
Commitment	.11	.08	-.13	-.08	-.25	-.19
Taking Steps	-.11	.03	-.04	-.03	.04	.27
Total Sustain Talk	-.08	.07	.14	-.10	-.30*	-.12

Note.

*
$p < .05$,

**
$p < .01$.

SOCRATES = Stages of Change Readiness and Treatment Eagerness Scale.

Correlation coefficient magnitudes must be greater than .24 for Outpatients and greater than .29 for Aftercare to reach significance.

Table 4
Univariate ANOVA Effects for Readiness to Change among Outpatient Sample

Dependent Variable	df	MS	F	p
Change Talk Subcategories				
Desire	2	0.017	1.28	.29
Ability	2	0.014	1.20	.31
Reason	2	0.184	8.01**	.001
Need	2	0.003	0.34	.71
Commitment	2	0.029	0.17	.20
Taking Steps	2	0.002	0.15	.86
Sustain Talk Subcategories				
Desire	2	0.009	1.27	.29
Ability	2	0.104	7.01**	.002
Reason	2	0.028	1.47	.24
Need	2	0.009	2.52	.09
Commitment	2	0.027	1.81	.17
Taking Steps	2	0.001	0.50	.61