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A Sequential Analysis of Clinician Skills and Client Change Statements in a Brief Motivational Intervention for Young Adult Heavy Drinking

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This study examined sequential relationships between clinician skills and client statements about behavior change in a randomized clinical trial comparing a brief motivational intervention (BMI) to a relaxation training control condition (REL) in a sample of heavy drinking young adults. Clinician and client interactions (N = 167) were assessed according to two established observational rating systems. Sequential analyses examined the transitional associations between clinicians' use of MI-eliciting skills (i.e., questions and reflections), MI-supportive skills (e.g., affirmations, emphasize client autonomy, statements of support), MI-inconsistent skills (e.g., confrontations, unsolicited advice), and subsequent client statements about behavior change (i.e., change talk or sustain talk). In both conditions, clinicians' use of MI-elicitation skills operated in a manner that was largely consistent (100% in BMI; 84% in REL) with the directional relationships proposed by MI theory (i.e., The Technical Hypothesis). More detailed analyses of the BMI condition showed clinician skills were related to statements about behavior change somewhat differently in drinking compared to coping discussions. While elicitations of change talk were associated with increased odds of their intended response (i.e., distal drinking and proximal coping change talk), elicitations of proximal coping sustain talk were associated with higher odds of proximal change talk. MI-supportive skills were also associated with increased odds of proximal change talk, and instances of proximal sustain talk were rare in the sample. This fine-grained analysis presents sequential transitions to client change and sustain talk with greater classification specificity than has been previously reported. Such efforts have the potential to advance our understanding of the function of MI skills in promoting client discussions about drinking (i.e., evoking) and coping (i.e., planning) behavior change.

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Brief motivational interventions (BMI) have demonstrated efficacy for reducing heavy and problematic alcohol use among young adults (e.g., Barnett, Murphy, Colby, & Monti, 2007; Borsari & Carey, 2005; Huh et al., 2015; Larimer et al., 2001; Marlatt et al., 1998; Scott-Sheldon, Carey, Elliott, Garey, & Carey, 2014). Recent work, referred to as therapeutic "process research," has emphasized identifying within-session Motivational Interviewing (MI) mechanisms in an effort to more clearly articulate the way in which MI leads to risk behavior reduction. The association between clinicians' use of MI skills and subsequent client statements for or against making a change (i.e., change talk and sustain talk, respectively) has been of particular interest, given the observed relation between these statements and client behavioral changes at follow-up (Magill et al., 2018). Some studies, however, rely on broad classifications of clinician skills and client statements, leaving gaps in our understanding of how therapists can elicit clients' motivational statements for or against making a behavior change within the session. This research builds upon previous work, by testing specific sequential associations among fine-grained classifications of clinician and client statements, and by examining these sequential associations in the context of a BMI and a relaxation training control condition.

MI PROCESS RESEARCH

Studies of within-session therapeutic process in MI have often focused on two categories of clinician skills (i.e., MI-consistent and MI-inconsistent), which are typically rated using an observational coding system, such as the Motivational Interviewing Skill Code (MISC; Houck, Moyers, Miller, Glynn, & Hallgren, 2010; Miller, Moyers, Ernst, & Amrhein, 2003, 2008). The goal of conducting such ratings is to illuminate the ways in which clinician statements relate to subsequent client statements, and to connect these interactions to the efficacy of the MI condition. Often called the Technical Hypothesis (Miller & Rose, 2009), the theoretical model predicts behavioral changes from the quality of MI technique. By subdividing encouraged (e.g., simple and complex reflections, open questions, affirmations) versus discouraged (e.g., advise without permission, warnings or confrontations) verbal skills, the intention is to provide empirically based guidance on what to say and not to say in an MI session. The theory posits that clinicians may facilitate behavioral changes through evoking client statements that are supportive of change (i.e., change talk), and early research showed that change talk mediates the relationship between clinicians' use of MI-consistent skills and alcohol use reduction during treatment among adults with alcohol use disorder (Moyers, Martin, Houck, Christopher, & Tonigan, 2009).

MI PROCESS RESEARCH AMONG YOUNG ADULTS

Studies examining MI process with young adults have led to some nuanced considerations about the predictive role of MI skills and the connection between use of these skills and client statements about behavior change. For example, use of MI-consistent skills has been associated not only with statements of change talk, but also with sustain talk among college student alcohol users (Apodaca et al., 2014; Vader, Walters, Prabhu, Houck, & Field, 2010). While the latter association may seem contrary to the notion that MI fidelity will reduce client resistance, it is consistent with the notion that MI will facilitate exploration of client ambivalence. Research with young adult males meeting risky drinking criteria found that reflections, but not open questions, evoked change talk, even though both skills are considered MI-consistent (Gaume, Bertholet, Faouzi, Gmel, & Daeppen, 2010). In addition, a higher proportion of simple reflections (i.e., an MI-consistent skill) among novice clinicians was associated with *worse* drinking outcomes at follow-up among a sample of college students (Tollison et al., 2008). This literature suggests that MI-consistent skills may not be universally positive regarding subsequent client responses. Moreover, Borsari and colleagues (2015) examined both technical and relational (i.e., clinician empathy and MI Spirit) processes in two samples of mandated college students. The study found that of all variables tested, MI Spirit was most predictive of subsequent reductions in alcohol use, and this effect was mediated by higher client self-exploration within the session. Collectively, prior research on MI process with young adults suggests three future considerations. First, MI-consistent skills influence change talk and sustain talk, and more measurement specificity may help determine skills related to ambivalence exploration versus evocation of change talk. Second, when examining important skills in MI, both technical and relational skills should be a part of the research design. Finally, when MI process among young people is of interest, current literature has most often examined college student samples and future studies should consider whether MI process is similar among young adults not attending a four-year college or university.

MEASUREMENT SPECIFICITY IN MI PROCESS RESEARCH

We have argued that examining technical and relational skill categories that are more specific than "MI-consistent" and "MI–inconsistent" may

further inform guidelines for MI delivery, and research involving a more specific taxonomy of skills is emerging. For example, an analysis of Motivational Enhancement Therapy sessions found that reflections of change and sustain talk were followed by higher levels of change and sustain talk, respectively. For open questions, the same pattern was observed (Moyers et al., 2009). Researchers have found similar sequential associations for these *valenced elicitations* (i.e., reflections and questions) across a range of behavioral domains, including smoking cessation (Lindqvist, Forsberg, Enebrink, Andersson, & Rosendahl, 2017), weight-related behaviors in adolescents (Carcone et al., 2013), and substance use (Barnett et al., 2014).

MI process researchers continue to refine available methods for rating MI skills (see e.g., MI-SCOPE; Sequential Code for Observational Process Exchanges; Martin, Moyers, Houck, Christopher, & Miller, 2005), but increased specificity regarding client change statements is also needed. A recent study argued that measurement of client change statements should discriminate between statements about the primary behavior change (i.e., *distal change language*, such as alcohol use reduction) and statements about the intermediate coping behaviors that will facilitate that behavior change (i.e., *proximal change language;* Magill, Apocada, et al., 2016). Analyses of sequential clinician and client interactions may also benefit from this additional measurement specificity. In the present study, we classify clinician elicitation skills and client change statements by valence (i.e., change versus sustain talk) and content (i.e., distal versus proximal). In doing so, MI process research can more directly consider Miller and Rollnick's (2013) most recent formulation regarding MI *evoking* versus MI *planning* processes. In summary, the extant literature is evolving toward greater levels of specificity in classifying both clinician and client statements within sessions. Such efforts can provide more specific, empirically based guidelines for MI delivery, training, and supervision, and this study may contribute to that effort.

STUDY PURPOSE

In this study, young adult clients' responses to clinicians' use of MI skills was of central interest. We sought to confirm some key within-session sequential relationships described in the literature with a novel, community-based sample of young adults. In doing so, we first investigated the association between clinician MI skills and subsequent client change and sustain talk in a BMI contrasted with an attention-matched control condition (Aim 1). Between-condition contrasts of sequential, communication models are quite rare in the literature, and have the capacity to highlight differences and similarities between MI and other brief modalities. Second, we sought to extend the MI sequential analysis literature by considering a more specific taxonomy of clinician and client statements to account for discussion content related to distal drinking and proximal coping behavior change (Aim 2). Here, we expected that (a) consistent with prior sequential research, therapist-valenced elicitations (i.e., change and sustain talk) would show increased odds of client language of the same valence and (b) that content-focused elicitations (i.e., proximal and distal statements) would relate to increased odds of client language of the same content focus.

Material and Methods

PARENT TRIAL OVERVIEW

Observational data were derived from audio-recorded individual intervention sessions in a randomized clinical trial contrasting BMI with a relaxation training control condition for reducing heavy drinking and related consequences in a sample of underage (ages 17–20) heavy drinkers transitioning out of high school and not enrolling at a 4-year college or university (Colby et al., 2018). Participants were non-treatment-seeking volunteers recruited via response to advertisements and recruitment events held at local high schools, community colleges, vocational/technical programs, social service agencies, and GED classes. Participants were considered eligible if they reported at least one past-month heavy drinking episode ($\geq$ 4/5 drinks per occasion for females/males) and were excluded if they were currently enrolled at a 4-year college, planned to enroll at a 4-year college, or planned to join the military within the next 12 months. The average age of participants was 18.2 (SD = 0.98; 42% female). Self-identified race and ethnicity were: 59% non-Hispanic White, 10% non-Hispanic Black/African American, 11% Hispanic, and 14% identified as more than one race. Participants reported a past-month average of 6.8 (SD = 4.12) drinks per occasion and 18.08 (SD = 14.19) percentage of heavy drinking days at baseline. Results of the trial indicated that the BMI condition was associated with significantly lower percent drinking days, heavy drinking days, drinks per week, and alcohol-related consequences at 6-week and 3-month follow-ups (Colby et al.). The trial is registered in the Clinical Trials Registry (NCT01546025) and the project procedures received IRB approval and participants gave written informed consent.

THE TWO STUDY CONDITIONS

Of the full sample of 168 participants, recorded sessions were available for N = 167, all of which

were used in the current analysis. Both interventions consisted of a single session, were typically 40 to 60 minutes in length, and were provided by the same clinicians across conditions. The BMI session followed a manualized format, beginning with rapport building, eliciting information about the developmental context of drinking, exploring the positive and negative aspects of drinking, and providing personalized feedback. For those interested in making changes to their drinking, a plan was identified and coping strategies were discussed. The contrast condition consisted of an attention-matched control, relaxation training (REL). REL similarly began with an introduction and general rapport building. The exploration phase considered current levels of participant stress and reviewed currently utilized coping behaviors. To promote treatment expectancies, a rationale and two instructional exercises were conducted. The session concluded with advice to continue using these techniques as a means of reducing stress and subsequent risk for heavy alcohol consumption.

Study clinicians were two Ph.D.-level clinical psychologists and one B.A.-level counselor with several years of counseling experience and coursework completed toward an M.S.W. degree. Fidelity to each intervention was monitored weekly with supervision and via assessments independently completed by the clinicians and participants (Colby et al., 2018). For observer ratings of MI fidelity, 97.6% of BMI sessions were rated as at least proficient on all five therapist global skillfulness ratings and 36.6% were rated as highly competent. In contrast, the REL sessions showed 12.0% proficiency and none were rated as highly competent in demonstration of MI principles. The BMI condition additionally showed a significantly higher proportion of MI-consistent skills than the REL condition, $M(SD)_{BMI} = 0.96(0.02)$, $M(SD)_{REL} = 0.25(0.12)$, $t(166) = 52.49$, $p < .001$). Finally, clinicians in the BMI condition also demonstrated proficiency according to MITI 3.1 benchmarks (Moyers et al., 2010) including 89.1% rated as at least proficient according to percentage of open questions (73.2% proficient, 15.9% competent), 98.8% rated as at least proficient according to percentage of complex reflections (3.7% proficient, 95.1% competent), 90.2% rated as at least proficient by reflection-question ratio (63.4% proficient, 26.8% competent), and 85.4% rated as at least proficient by percent MI-Adherent behaviors (61% proficient, 24.4% competent).

OBSERVATIONAL RATING MEASURES

Two observational rating measures were used in this study. Client change language was assessed with the Client Language Assessment–Proximal/Distal (CLA-PD; Magill, Apodaca, et al., 2016), a measure originally developed to analyze client change statements in skill-based behavior change interventions. In the CLA-PD, there are five dimensions of change and sustain talk (i.e., reason, ability, commitment, taking steps, other), which are adapted from the client portion of the Motivational Interviewing Skill Code (MISC; Miller et al., 2003, 2008). In contrast to the MISC, each of these codes has been subdivided to discriminate statements about the primary behavior (i.e., distal change and sustain talk, in this case about changing drinking) from those statements about the intermediate coping behaviors (i.e., proximal change and sustain talk) that are expected to facilitate changes in that behavior (21 total possible client language codes, including neutral). An example of a statement of distal change talk is: "I will drink less on weekends" versus a proximal change talk statement: "I will tell one friend about my drinking goal." The advantage of the CLA-PD is it results in separate codes for clinician-client discussions about the primary targeted outcome (i.e., exploration of the change goal) from discussions about how to achieve that outcome (i.e., planning for the change goal; Magill, Apodaca, et al., 2016; Magill, Walthers, et al., 2016).

Clinician skills were categorized with a modified version of the most recent MISC (2.5; Houck et al., 2010). The MISC 2.5 differs from previous versions in that it discriminates between clinician skills that elicit client statements in support of change, against change, or neutral/neither. For this study, we further expanded upon this typology to discriminate elicitations of proximal statements from elicitations of distal statements, which yielded 16 types of clinician elicitations. Specifically, there were four possible types of clinician elicitations (i.e., open questions, closed questions, simple reflections, and complex reflections) times four possible types of valence and content focus: distal change talk, proximal change talk, distal sustain talk, and proximal sustain talk (see Table S1 for examples). Finally, a valence of "ambivalence" is defined as statements showing equal weight toward or away from change and a valence of "neutral" is defined as content that is not relevant to the focus of the intervention (e.g., asking about the weather or general life circumstances) or whose function is not to elicit a client's attitude regarding making a change (e.g., "How many drinks per week do you drink?").

RATER TRAINING AND DATA COLLECTION PROCEDURE

Two bachelor's-level raters received roughly 60 hours of training by the third and last authors. Rater

training followed standard procedures in three phases: (1) didactic overview; (2) group coding practice with corrective feedback; and (3) individual coding practice with group corrective feedback. For clinician and client ratings, proficiency was defined by Intraclass Correlation Coefficient (ICC; two-way mixed; single measure) values of .75 or above (Cicchetti, 1994) and Cohen's kappa values of at least .60 (Landis & Koch, 1977). Data collection occurred in two stages. First, audio-recorded interviews were segmented (i.e., parsed) into individual clinician and client statements. Once parsed, each clinician statement was assigned a rating from the MISC and each client statement was given a rating from the CLA-PD. All data collection was performed using the CASAA Application for the Coding of Treatment Interactions (CACTI; Glynn, Hallgren, Houck, & Moyers, 2012). Inter-rater reliability was maintained via weekly meetings in which project members participated in group exercises, discussed difficult items, and resolved rating discrepancies. As outlined in the grant proposal, a 20% random subsample of interviews was selected to be rated for inter-reliability. Once a full accounting of the available interviews for coding was complete and prior to the beginning of data collection, interviews were randomly selected to score for reliability and randomly assigned to one rater from the pool of available raters, while ensuring that the same rater never scored both passes of an interview. All agreement statistics for the present report (i.e., item-level kappa coefficients; Bakeman & Quera, 2011; maximum attainable kappa coefficients; Umesh, Peterson, & Sauber, 1989) were computed using SPSS 24.

DATA AGGREGATION AND ANALYSIS OF SEQUENTIAL RELATIONSHIPS

From rated interview files, chains of consecutive codes were compiled into plain text format and entered into the Generalized Sequential Querier version 5.1 (Bakeman & Quera, 2011). For study Aims 1 and 2, transitional probabilities between clinician skills and client change statements were examined. However, a portion of the expected cell frequencies in these analyses were less than 5, which is a violation of the chi-square assumption and could result in unstable parameter estimates (Wickens, 1982). Therefore, clinician and client statements were aggregated into theoretically meaningful categories that yielded acceptable cell frequencies across conditions. Specifically, for Aim 1, questions and reflections were aggregated into: elicitations of change talk; elicitations of sustain talk; and elicitations of neutral/ambivalent content. MI-consistent clinician skills not otherwise classified as elicitations (i.e., Advise with Permission, Raise Concern with Permission, Support, Affirm, Emphasize [client] Control) were aggregated into the MI-supportive skills category, while MI-inconsistent skills (i.e., Advise without Permission, Raise Concern without Permission, Confront, Warn, Direct) were aggregated into the MI-inconsistent skills category. All remaining clinician statements were aggregated into "other" clinician skills (i.e., Facilitate, Filler, Give Information, Structure). Client statements were aggregated into change talk, sustain talk, and neutral. For Aim 2, less aggregation was required to yield acceptable frequencies for the BMI condition. Here, clinician elicitations of distal change talk, distal sustain talk, proximal change talk, proximal sustain talk, and neutral/ambivalence were examined. The remaining clinician groupings were consistent with those described above for Aim 1. Finally, client statements were aggregated into: distal change talk, distal sustain talk, proximal change talk, proximal sustain talk, and neutral. Once aggregation was complete and transition matrices were computed, deviation of transition matrices from a matrix of random transitions was assessed by computing the chi-square coefficient and Cramer's V, which provides a correlation coefficient for the strength of association in contingency tables larger than 2 × 2 (Cock & Stavig, 1979).

Despite aggregation of the observed codes, some cell frequencies continued to be sparse (e.g., transitions to sustain talk), and this phenomenon can bias the magnitude of odds ratio estimates (Gelman, Jakulin, Pittau, & Su, 2008). As a result, we reestimated the transition matrix with Empirical Bayes priors, using an approach similar to that described by Houck and Moyers (2015). Using the fitdistr function from the MASS package in R version 3.3.3 (R Core Team, 2013), the alpha and beta parameters from the beta distribution were estimated, which yielded probability values for the numerator and denominator of the odds ratios. Next, odds ratios among the entire sample at the individual-level (i.e., rather than the sample-level) were reestimated using the empirical priors. Finally, statistical tests of significance were performed by log-transforming the Bayes estimated odds ratios, computing means and standard deviations, and performing *t* tests against the estimated expected values (Goodman, 1969).

Results

INTER-RATER RELIABILITY

Table 1 shows reliability estimates for a randomly selected subsample of $N = 37$ sessions. Cohen's kappa for $N = 2$ observers and $k = 15$ categories was .78, indicating a high degree (approximately

Table 1
Reliability and Descriptive Information

Code	*Kappa*[1,5]	K^2_{Max}	Min[3]	Max[3]	Mean[3]	(SD)[3]
Client Behaviors						
Change Talk-Distal	.75	.96	0	143	35.34	(39.67)
Sustain Talk-Distal	.71	.99	0	87	16.83	(19.33)
Change Talk-Proximal	.63	.91	1	55	14.17	(11.91)
Sustain Talk-Proximal	.57	.98	0	27	2.46	(4.12)
Follow/Neutral	.83	.97	5	443	93.55	(80.33)
Clinician Skills						
Elicit - CTD	.77	.99	0	99	26.73	(29.87)
Elicit - STD	.76	.97	0	46	9.44	(11.09)
Elicit - CTP	.56	.90	0	40	9.64	(9.59)
Elicit - STP	.47	.98	0	15	1.36	(2.45)
Elicit - Neutral	.80	1.0	4	174	55.69	(42.24)
MI-Supportive	.80	.98	1	83	23.74	(18.96)
MI-Inconsistent	.95	.99	0	146	43.10	(42.22)
Other	.88	.99	14	396	76.25	(46.25)
Overall Agreement	.78[4]					

Notes. CTD = Change Talk Distal; STD = Sustain Talk Distal; CTP = Change Talk Proximal; STP = Sustain Talk Proximal; FN = Follow/Neutral.[1]Reliability estimates based on $N = 37$ double-coded sessions. [2]K_{Max} = maximum attainable kappa [3] Descriptive data based on $N = 167$. [4]For $N = 2$ raters and $k = 15$ categories and highly variable code frequency, Bakeman and Quera (2011) suggest a Cohen's Kappa of approximately .79 to ensure rater accuracy of 90% in classification. [5]For $N = 2$ raters, $k = 2$ categories and highly variable code frequency, Bakeman and Quera (2011) suggest a Cohen's Kappa of approximately .44 to ensure rater accuracy of 85% in classification.

90 percent) of rater agreement in coding overall (Bakeman & Quera, 2011). Cohen's kappa for individual codes ranged from .47 to .95, suggesting acceptable rater agreement ($\geq$ 85% for all codes) in classification for $N = 2$ raters and $k = 2$ categories (Bakeman & Quera, 2011).

AIM 1: SEQUENTIAL ANALYSES CONTRASTING BMI AND REL

Table 2 displays the Empirical Bayes odds ratios for clinician-to-client transitions in both the BMI and REL conditions. Additionally, Table 2 shows a decision column illustrating consistency with directional expectations derived from the MI Technical or Relational Hypotheses (i.e., yes, no, not applicable; Miller & Rose, 2009); when transitions were not significantly different from chance, no decision was indicated. The transition matrix for the BMI condition consisted of 51,921 transitions from 84 recorded brief motivational interviews, which deviated significantly from a matrix of random transitions, χ^2 (64) = 55322.95, $p < .01$, Cramer's $V = .36$. The transition matrix for the REL condition consisted of 17,350 transitions from 83 recorded interviews and also deviated significantly from a matrix of random transitions, χ^2 (64) = 20722.88, $p < .01$, Cramer's $V = .39$.

Table 2 summarizes association between clinician elicitations and client change, sustain, and neutral talk. In both conditions and relative to chance, elicitations of change talk were associated with increased odds of subsequent change talk and decreased odds of neutral content. While in the BMI condition, there was an association with decreased sustain talk, the opposite pattern occurred in the REL condition. Elicitations of sustain talk also had increased odds of being followed by sustain talk in both conditions and decreased odds of being followed by all other statement types. Elicitations of neutral content were associated with greater odds of subsequent neutral content from the client in both conditions and lower odds of all other statement types. Among elicitation skills, 100% of the transitions of interest were consistent with MI theory in BMI compared to 84% in the REL condition (see Table 2).

In both conditions, MI-supportive skills were associated with higher odds of neutral content. In the BMI condition, MI-supportive skills were associated with reduced odds of change and sustain talk, and in the REL condition, increased odds of sustain talk. In contrast, MI-inconsistent skills were related to decreased odds of neutral content, and increased odds of change talk and sustain talk in both conditions. Here, the rate of agreement with the directional expectations of MI theory was 50% in both conditions (see Table 2). Finally, and while not of primary interest, clinician "other" skills (e.g., providing information) were associated with increased odds of neutral content in both conditions, decreased odds of change talk in both conditions, and decreased odds of sustain talk in the BMI condition.

Table 2
Comparison of Elicitations of Change Talk, Sustain Talk, and Neutral Talk in BMI vs REL

Transition	BMI			REL		
	EB OR	*EB p*	Consistent with MI Theory	*EB OR*	*EB p*	Consistent with MI Theory
ELCT→CT	19.06	<.001	Y	17.14	<.001	Y
ELCT→ST	0.43	<.001	Y	1.25	.003	N
ELCT→FN	0.11	<.001	Y	0.08	<.001	Y
ELST→CT	0.29	<.001	Y	0.58	<.001	Y
ELST→ST	51.01	<.001	Y	50.66	<.001	Y
ELST→FN	0.17	<.001	Y	0.10	<.001	Y
ELN→CT	0.19	<.001	NA	0.35	<.001	NA
ELN→ST	0.33	<.001	NA	0.48	<.001	NA
ELN→FN	7.93	<.001	NA	3.69	<.001	NA
MI-SUP→CT	0.67	<.001	N	1.01	.134	-
MI-SUP→ST	0.65	<.001	Y	1.12	.002	N
MI-SUP→FN	2.45	<.001	NA	1.29	<.001	NA
MIIN→CT	1.84	<.001	N	2.26	<.001	N
MIIN→ST	3.29	<.001	Y	4.76	<.001	Y
MIIN→FN	0.88	<.001	NA	0.57	<.001	NA
OTHER→CT	0.58	<.001	NA	0.82	<.001	NA
OTHER→ST	0.90	<.001	NA	1.12	<.001	NA
OTHER→FN	1.99	<.001	NA	1.33	<.001	NA

Notes. EB = Empirical Bayesian Estimate; MI = Motivational interviewing; REL = relaxation; EL = Elicitation; CTD = Change Talk; STD = Sustain Talk; FN = follow/neutral; ELN = Elicit Ambivalence/Neutral; MI-SUP = MI-Supportive; MIIN = MI-Inconsistent.

AIM 2: SEQUENTIAL ANALYSES OF BMI

Table 3 displays a detailed view of data for BMI clinician-to-client transitions. The full transition matrix for the BMI condition with a more granular classification of utterances than Aim 1 consisted of 51,921 transitions from 84 recorded brief motivational interviews, which deviated significantly from a matrix of random transitions, χ^2 (324) = 89,846.71, $p < .001$, Cramer's $V = .38$.

Table 3 illustrates the association of clinician elicitations with client distal and proximal statement subtypes. Relative to chance, clinician elicitations of distal change talk were associated with increased odds of being followed by client distal change talk and decreased odds of neutral content. For clinician elicitations of distal sustain talk, these skills had significantly higher odds of being followed by client distal sustain talk and lower odds of being followed by both distal change talk and neutral content. Similarly, clinician elicitations of proximal change talk were associated with increased odds of client proximal change talk, decreased odds of neutral content, and showed no association with proximal sustain talk. However, elicitations of proximal sustain talk were also associated with increased odds of client proximal change talk. In contrast to distal statements, elicitation transitions to proximal sustain talk could not be estimated due to low variability at the individual, client level. Finally, elicitations of neutral content, which included proximal and distal statements, were related to increased odds of neutral content and decreased odds of distal change and sustain talk.

Table 3 also illustrates the association of clinician MI-supportive and MI-inconsistent skills with client distal and proximal statement subtypes. MI-supportive skills were associated with increased odds of being followed by proximal change talk, but decreased odds of being followed by distal change talk as well as increased odds of neutral content. Transitions to distal and proximal sustain talk could not be estimated. MI-inconsistent skills were associated with increased odds of distal change talk, distal sustain talk, proximal change talk, and decreased odds of neutral content (proximal sustain talk could not be estimated). Finally and not shown in Table 3, "other" clinician skills were associated with significantly higher odds of subsequent neutral content and lower odds of all other content.

Discussion

Prior research on MI-based interventions has shown broadly that clinician MI-consistent skills are associated with client language both for and against behavior change, and emerging research has highlighted that this is largely the function of directional or *valenced* clinician questions and reflections (Barnett et al., 2014; Carcone et al.,

Table 3
Transitional Probabilities and Odds Ratios for Elicitations of Drinking and Coping Talk in BMI

Transition	Observed frequency	Expected frequency	EB OR	EB *p*
ELCTD→CTD	2814	848.13	25.76	<.001
ELCTD→STD	146	360.28	0.98	.59
ELCTD→FN	830	2341.61	0.17	<.001
ELSTD→CTD	83	304.19	0.33	<.001
ELSTD→STD	979	129.22	21.32	<.001
ELSTD→FN	306	839.85	0.18	<.001
ELCTP→CTP	706	69.71	31.53	<.001
ELCTP→STP	42	11.39	-	-
ELCTP→FN	186	620.62	0.16	<.001
ELSTP→CTP	22	11.19	6.02	<.001
ELSTP→STP	95	1.83	-	-
ELSTP→FN	29	99.59	0.26	<.001
ELFN→CTD	548	1468.83	0.21	<.001
ELFN→STD	258	623.94	0.35	<.001
ELFN→CTP	97	455.50	-	-
ELFN→STP	20	74.42	-	-
ELFN→FN	5755	4055.31	3.83	<.001
MI-SUP→CTD	113	389.31	.27	<.001
MI-SUP→STD	44	165.37	-	-
MI-SUP→CTP	231	120.72	2.28	<.001
MI-SUP→STP	19	19.73	-	-
MI-SUP→FN	1363	1074.85	2.00	<.001
MIIN→CTD	32	33.43	1.41	<.001
MIIN→STD	8	14.20	3.93	<.001
MIIN→CTP	27	10.36	7.07	<.001
MIIN→STP	5	1.69	-	-
MIIN→FN	80	92.30	0.66	<.001

Notes. EB = Empirical Bayesian Estimate; BMI = Brief Motivational Interview; EL = Elicitation; CTD = Change Talk Distal; STD = Sustain Talk Distal; CTP = Change Talk Proximal; STP = Sustain Talk Proximal; FN = follow/neutral; ELN = Elicit Ambivalence/Neutral; MI-SUP = MI-Supportive; MIIN = MI-Inconsistent.

2013; Davis, Houck, Rowell, Benson, & Smith, 2016; Lindqvist et al., 2017). However, this body of literature has yet to consider valenced elicitations in other behavioral modalities, including modalities intended to control for nonspecific factors such as attention from a clinician, a therapeutic rationale/ritual, or expectancy for behavior change. Studies also have not considered how MI-elicitation, MI-supportive, and MI-inconsistent skills function when the topic of discussion is drinking behavior change (i.e., *distal outcome*) versus coping behavior change (i.e., *proximal outcome*). In this study, we pursued these research directions in a community-based sample of heavy drinking young adults, and the following themes emerged.

Clinicians tend to get the client language about change that they *ask for*. Skills aimed at eliciting a specific type of change statement significantly increased the likelihood that the client would provide the intended statement. This pattern has been shown in previous studies of BMI, and held here in both BMI and the attention-matched, REL condition. Our results suggest the evocative approach of MI, and the differential reinforcement of certain verbal content within sessions may have broad applicability. This speculation has been suggested by MI scholars (Miller & Rollnick, 2013), as well as in discussions of other psycholinguistic approaches such as Solution-Focused Therapy (Lewis & Osborn, 2004) and Acceptance and Commitment Therapy (Bricker & Tollison, 2011). The relationship between clinician elicitations and subsequent client language also held across conditions despite lower empathy and MI spirit ratings within the REL condition. This finding is inconsistent with the suggestion that a highly empathic relationship is a necessary precondition for the technical process to function (Moyers, 2014). However, it may also be the case that the level of interpersonal skillfulness needed to establish a positive working relationship was lower in this treatment-naïve, young adult sample.

The relationship between MI-consistent clinician skills and client change language may be driven by clinician elicitation technique rather than by supportive skills. In both the BMI and REL conditions, MI-supportive skills were associated with increased odds of subsequent neutral content. In BMI, MI-supportive skills were associated with reduced odds of client change and sustain talk, while in the REL condition, the odds of sustain talk were increased. MI theory suggests that both technical and relational skills are associated with client within- and postsession outcomes (Miller & Rose, 2009). Our results suggest that much of the direct relationship between MI-consistency and subsequent change talk is accounted for by clinician elicitation skills (i.e., questions and reflections). This interpretation is supported by other sequential studies involving MI with adolescents and young adults (Davis et al., 2016; Gaume et al., 2010) as well as more recent research suggesting that MI consistency, without the use of specific elicitation techniques, shows little or no association with change talk or sustain talk (Lindqvist et al., 2017; Romano, Arambasic, & Peters, 2017). Unfortunately, we did not assess affirmation statements separately in the current study. It is possible, given their role in supporting client self-efficacy, that affirmation statements are an exception and successfully elicit positive client statements about change (Apodaca et al., 2016).

In BMI, therapist skills relate differently to client statements about changes in drinking, compared to changes in coping discussions. Although valenced distal elicitations functioned in a manner that was

consistent with theoretical expectations (i.e., the valance of the elicitation matched the valence of the response), only elicitations of proximal change talk were associated with proximal change talk statements. In contrast, elicitations of proximal sustain talk were also related to increased odds of proximal change talk, and transitions to proximal sustain talk were too rare or invariable to be estimated. These analyses of distal compared to proximal statements shed some light on the unexpected Aim 1 results for MI-supportive skills (noted above). Specifically, MI-supportive skills in BMI actually were associated with a positive client response, but only with increased odds of proximal, and not distal, statements in favor of change. This sequential association was not observed in the above analyses that averaged across therapist elicitation subtypes. Overall, the current study results highlight that MI skills function differently in MI-evoking compared to MI-planning process, and that MI-supportive skills such as advising with permission, emphasizing client autonomy and control, and providing affirmative statements could be particularly important once a goal is identified and the steps toward achieving that goal are the topic of discussion. This conclusion should be considered preliminary, however, because the planning component in the current study did not provide sufficient length or depth to populate all of the transition cells of interest. Given that appropriate planning has been associated with positive behavior change outcomes (Elfeddali, Bolman, Candel, Wiers, & De Vries, 2012; Gollwitzer & Sheeran, 2006; Moody, Poe, & Bickel, 2017; Sniehotta, Schwarzer, Scholz, & Schuz, 2005), a more detailed examination of these discussions in lengthier or more focused planning phases (e.g., BMI booster sessions; skill-based interventions) is certainly warranted.

LIMITATIONS

This study has some limitations to consider. First, the manualized and didactic structure of the control condition necessarily yielded a low occurrence of many clinician-to-client transitions, which prevented many between-condition comparisons. Second, there might exist a degree of conversational momentum influencing transitional probabilities. That is, the relationship between an elicitation and its response may partially be a function of the state of the conversation prior to the elicitation. Future research would do well to take this possibility into account, although recent findings indicate that some clinician elicitations may actually have the effect of breaking such momentum and shifting the direction of discussion (Laws et al., 2018). Another limitation is the assumed directionality of the present analyses, which emphasized the effect of the clinician *on* the client even though a conversation is a bi-directional phenomenon. Our rationale here was merely to present one aspect of the view: the aspect most aligned with actionable information for the MI clinician, supervisor, or trainer. Finally, it may be that the present questions surpassed the capacities of the data, as evidenced by a portion of odds ratio values that could not be estimated. Therefore, Aim 2 findings should be interpreted with some caution.

Conclusions

The present study yields findings complementary to previous sequential analyses in MI process research. Because client language has demonstrated predictive validity with respect to changes in a variety of behaviors (Magill et al., 2014; 2018; Moyers et al., 2009; Romano & Peters, 2016), the present work adds to a growing body of literature suggesting that clinicians should use targeted questions and reflections whose valence reflects the desired client response in order to facilitate exploration and resolution of ambivalence about change. These sequential relationships were largely consistent between conditions, indicating that employing an MI-technical skillset has desirable effects on client discussions across therapeutic contexts. The present study also highlights the importance of considering content-focused elicitations in MI technical process studies. In distal (i.e., drinking-focused) discussions, the effect of clinician elicitations was reliably consistent with expectations, but the association with client language in proximal (i.e., coping-focused) discussions appeared to be more variable. This may reflect differences in the MI evoking compared to planning processes, and future studies should consider this speculation further. Finally, MI-supportive skills may be particularly important for eliciting positive change statements during the MI planning process.

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Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

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