HHS Public Access

Author manuscript

Addiction. Author manuscript; available in PMC 2017 June 01.

Published in final edited form as:

Addiction. 2016 June ; 111(6): 1011–1020. doi:10.1111/add.13313.

Therapist and Client Discussions of Drinking and Coping: A Sequential Analysis of Therapy Dialogues in Three Evidence-Based Alcohol Use Disorder Treatments

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Abstract

Background and aims—Research into the active ingredients of behavioral interventions for alcohol use disorders (AUD) has focused on treatment-specific factors often yielding disappointing results. The present study examines common factors of change in motivational enhancement therapy, cognitive-behavioral therapy, and twelve-step facilitation therapy by 1) estimating transitional probabilities between therapist behaviors and subsequent client Change (CT) and Sustain (ST) Talk and 2) examining therapist skillfulness as a potential predictor of transition probability magnitude.

Design—Secondary data analysis examined temporal associations in therapy dialogues.

Setting—USA: data were from Project MATCH (1997).

Participants—*N* = 126 participants who received Motivational Enhancement Therapy, Cognitive-Behavioral Therapy, or Twelve-Step Facilitation Therapy.

Measurements—Therapist behaviors were measured in three categories (Exploring, Teaching, Connecting) and client statements included five categories (CT-Distal, ST-Distal, CT-Proximal, ST-Proximal, Neutral). Therapist skillfulness was measured using a 5-point ordinal scale.

Findings—Relative to chance, therapist exploratory behaviors predicted subsequent client discussion of distal, drinking behavior (*OR* = 1.37 to 1.78, $p < .001$) while suppressing discussion of proximal coping and neutral content (*OR* = .83 to .90, $p < .01$). Unexpectedly, therapist teaching suppressed distal drinking language (*OR* = .48 to .53, $p < .001$) and predicted neutral content (*OR* = 1.45, $p < .001$). Connecting behaviors increased both drinking and coping language, particularly language in favor of change (CT *OR* = 1.15 to 1.84, $p < .001$). Analyses of exploring and connecting skillfulness revealed that high skillfulness maximized these behaviors effect on client responses, but not teaching skillfulness.

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Declaration of Interests: None

Conclusions—In motivational enhancement therapy, cognitive-behavioral therapy, and twelve-step facilitation therapy for alcohol use disorders, the therapists who explore and connect with clients appear to be more successful at eliciting discussion about change then therapists who engage in teaching behavior. Therapists who are more skilled achieve better results than those who are less skilled.

Keywords

Active Ingredients; Change Talk; Mechanisms of Behavior Change; Process Research; Sequential Analysis

Introduction

Despite Moos and Finney's [1] seminal call to uncover the "black box of treatment", studies of the mechanisms by which behavioral interventions effect change (i.e. process research) have only recently been undertaken. To date, these efforts have typically looked toward ingredients specific to a single treatment modality and their predictions have often gone unsupported [2]. This has held true even for the most well-designed research. In Project MATCH, over twenty treatment-specific causal models failed to yield significant results [3–5]. Citing null or mixed findings on differential therapy effects, Morgenstern and McKay [6] have concluded there is little support for treatment-specific ingredients as a primary mechanism of action in AUD treatment.

The noted results suggest a need to search for factors that are *common* to a variety of substance use treatments rather than searching for active ingredients *specific* to individual treatment approaches [see also 7]. In one such effort, Michie and colleagues [8] identified 42 behavior change techniques utilized in a range of alcohol intervention modalities (e.g., boost motivation and self-efficacy, facilitate relapse prevention). This notion of common- rather than treatment- specific factors is long-standing [9,10] and has received empirical support. For example, a general psychotherapy review by Lambert and Barley [11] showed common factors (e.g., therapeutic alliance) accounted for a much larger portion of the variance in outcome than treatment-specific ingredients. Wampold's [12] meta-analytic research in mental health also did not find evidence that 'bona fide' psychotherapies had differential efficacy, a result that has since been replicated for alcohol treatment [13].

MI as a template for studying common factor mechanisms of change in AUD treatment

Despite a general lack of support for treatment-specific ingredients, one promising line of research is the study of causal process in Motivational Interviewing (MI). MI is a client-centered approach to therapy that creates a safe, exploratory atmosphere for clients to identify personal values, capacities, and reasons regarding behavior change [14]. Since its inception, MI has become widely adopted [15], and has gathered considerable evidence for effectiveness [16–18]. In MI, the primary proposed mechanism of change is client verbalized decision-making (i.e., Change Talk and Sustain Talk). Miller and Rollnick have defined Change Talk as "any self-expressed language that is an argument for change" (14, p. 159) and Sustain Talk as "the person's own arguments for *not* changing, for sustaining the status quo" (14, p. 7). The underlying argument is this language can generate a shift in attitudes; a

notion based on Bem's theory of self-perception [19]. Applied to the MI context, a client's statements in favor of making a change should cause a desire for those changes, in turn leading to actual changes in behavior. In the present work, we argue that the promise of MI may be largely due to its capitalization on common factors of change such as, Rogerian client-centered techniques, a focus on motivation and self-efficacy, and exploratory methods to promote client decision-making.

The hypothesized role for client language about behavior change decisions has achieved empirical support. For example, strength of commitment language near the end of MI sessions has predicted self-reported drug use at one year follow-up [20]. Moyers and colleagues [21] found that for a sample of $N = 118$ Project MATCH patients assigned to Motivational Enhancement Therapy (MET), the amount of Change Talk in the first session predicted both the slope for number of drinks per week in weeks 1 thru 5 and the number of drinks per week during the 5^{th} week of treatment, in the expected directions. Further, a recent meta-analysis of MI mechanisms in 12 studies showed that frequency of client Sustain Talk was associated with poorer client outcomes and that a combined measure of Change and Sustain Talk was associated with overall outcomes in the positive direction [22].

Client language is emerging as a potentially important mechanism of MI-facilitated behavior change. Yet, there is little reason to expect that this phenomenon is limited to MI. Indeed, as a general perspective on cognition and behavior, self-perception theory's scope and utility stretches far beyond the MI literature. Research has shown that both attitudes [19,23,24] and behaviors [25,26] are susceptible to the effects of self-perception. We can, therefore, propose that client language is a common factor of change rather than one that is MI-specific. Preliminary evidence bears this out, as Moyers and colleagues [27] showed that both Change and Sustain Talk across Project MATCH treatments (i.e., not just MET, but also cognitive behavior therapy [CBT], and twelve-step facilitation [TSF]) were predictive of drinking outcomes, in the expected directions, up to 15 months later.

Therapist behaviors in evidence-based AUD treatments: Common or specific factors?

The MI literature has frequently shown that therapist behaviors have a significant impact on the relative levels of Change and Sustain Talk uttered by the client. This relationship has been confirmed at the session-level [28], and in sequential analyses [27], which preserve temporal sequence and thus lend greater credibility to cause-effect conclusions. In these studies, MI-Consistent behaviors (e.g., reflections, open questions, affirmations) have increased subsequent Change Talk [27,29–31] and Sustain Talk [29,30], while MI-Inconsistent behaviors (e.g., confrontation, advising without permission) increased Sustain Talk only [27,29–31]. We argue the actual skills represented within these MI categories, as well as their function within the therapeutic dialogue, are likely relevant to all behavioral therapies. In the present work, we argue these skills comprise one of three core functions in AUD treatment: *Exploring* client attitudes about change, *Teaching* or advising clients about change, and *Connecting* to clients interpersonally [32]. Indeed, these three functions encompass many of the behaviors described in the MI process coding systems and closely resemble several of the common components described in the FRAMES approach [33].

Purpose of the present study

Progress has been made in our understanding of the importance of client language and therapist behavior in MI-based therapies. However, comparatively little is known about how these and similar processes operate in *other* evidence-based AUD treatments. The purpose of this study was to extend theoretical and methodological work, established in the MI literature, to the study of process in behavior change interventions more broadly. Of particular interest was the inclusion of multi-session, didactic/skill-based interventions to characterize a larger majority of frontline care [15] than has previously been the case in the AUD treatment literature. We incorporated a novel conceptual framework and two novel observational rating systems (see Measures) to study sequential associations between therapist and client within-session behaviors. To better understand process in didactic/skill-based interventions, we also propose two [rather than one; 14] client language pathways: 1) decisions about changing the primary target behavior (*distal change*) and 2) decisions about engaging in prescribed coping activities expected to facilitate changes in the primary target behavior (*proximal change*).

This study had two aims:

1. To estimate the magnitude of transitional probabilities from therapist Explore, Teach, and Connect behaviors to client Change and Sustain Talk about distal drinking and proximal coping outcomes.
2. To test therapist skillfulness in executing each behavior as a predictor of therapist-to-client transition probability magnitude.

Method

Study sample

Data were derived from a sample of participants from a northeast Project MATCH clinical research site ($N = 168$). Project MATCH was a nation-wide study in which individuals were randomized to one of three treatment conditions (MET; CBT; TSF) across 10 research sites ($N = 1726$). These participants were treatment-seeking adults meeting criteria for an alcohol use disorder. The sample was majority male (72%), Caucasian (80%), had a mean age of 40.24 years, and were 33% married and 63% full-time employed [3]. The study showed main effects across treatments, but found very little support for treatment-specific matching effects and subsequent causal process models [4]. In the present study, recorded sessions were available for 89.3% of the site sample. From these participants, only those with at least three usable audio-recorded sessions were selected, yielding 126 participants (106 with at least four recorded sessions and 20 with three sessions). This sample was 45($SD = 13.3$) years old, majority male (69.8%) and Caucasian (94%), 38% were married and 61% were employed full-time.

Study session data

A high level of therapy adherence and intervention integrity were achieved in Project MATCH [34], making this dataset optimal for process analyses of evidence-based, behavioral addictions treatment. Because MET spanned four sessions, while CBT and TSF

spanned 12, the first three and final sessions attended were selected for observation. This strategy allowed for a consistent number of observations across treatments, and yielded *Nsessions* = 484 for observational coding. Our selection approach is consistent with the methods of other projects conducting secondary analyses of MATCH session data [35–37].

Observational rating measures

Two novel observational coding systems were used in this study. Therapist behaviors were categorized and measured with the Alcohol Intervention Mechanisms Scale [AIMS; 38]. The AIMS was developed to study common factor processes based on identified commonalities in the underlying *function* rather than explicit *content* of therapist interventions in behavior change treatments for addictive disorders. The primary therapy functions identified in the AIMS are to: Explore (four behavior count codes: Explore Change Questions and Reflections, General Assessment, and Goal Setting), Teach (five behavior count codes: Homework Teaching and Exploring, Teach/Advise, Structure/Treatment Information, and Self-Disclosure), and Connect (three behavior count codes: Affirm/Self-Efficacy, Empathy/Support, Emphasize Control/Collaboration). Therapist behavior counts provide a frequency rating of occurrence. Therapy functions are then rated on a 5-point skillfulness scale, which provide a quality valence to the overall session. The AIMS has demonstrated reliability (reported here; Table 1) as well as preliminary predictive validity in relation to subsequent client mechanisms of change [32].

Second, client change language was assessed in two primary language categories with the Client Language Assessment – Proximal/Distal (CLA-PD) [39]. The measure was developed to accommodate process research on skill-based, multi-session behavior change treatments for addictive disorders. In the CLA-PD, there are five codes for Change Talk (reason, ability, commitment, taking steps, other), which are adapted from the client portion of MISC [40–42]. In contrast to the MISC, each of these codes have been sub-divided to discriminate speech regarding the primary behavior change (Distal Change and Sustain Talk) from those regarding the intermediate coping skills (Proximal Change and Sustain Talk) that are hypothesized to facilitate that behavior change. The CLA-PD has shown good reliability (reported here; Table 1) as well as predictive validity in relation to client post-session mechanisms and post-treatment drinking behaviors [43].

Rater training and study procedure

For the present study, three bachelor's level raters received roughly 60 hours of training by the first author. Rater training followed standard procedures in three phases: 1) didactic overview, including related readings [44–46], 2) group coding practice with corrective feedback, and 3) individual coding practice with group corrective feedback. For therapist and client behaviors, rater proficiency and ongoing project reliability were defined by Intraclass Correlation Coefficient (ICC; two-way mixed; single measure) values of .75 or above [47]. For the therapist skillfulness ratings, Cohen's quadratic weighted kappa values were expected to be .61 or greater [48]. Data were collected via the CASAA Application for Coding Treatment Interactions, which is a software program for parsing and coding therapy session audio files [49].

Data-analysis

From audio-recorded sessions, chains of consecutive codes were compiled into plain text format and entered into the Generalized Sequential Querier version 4.5 (GSEQ) [50]. For Aim One sequential analyses, *same type* transitions from therapist to client behaviors were examined [26]. Therapist behaviors were collapsed into three categories (Explore, Teach, Connect) and client behavior codes were collapsed into five categories (Change Talk [CT]-Distal, Change Talk [CT]-Proximal, Sustain Talk [ST]-Distal, Sustain Talk [ST]-Proximal, Follow/Neutral). This approach maintained sufficient expected cell count frequencies across the transition matrix [51].

To examine the association between therapist skill and therapist-to-client transitions (Aim Two), sequential data transitional probabilities and global skillfulness ratings for recorded sessions were exported from GSEQ to SPSS version 22 for subsequent hypothesis testing. First, 5-point skillfulness ratings were recoded into high (rating 4–5), medium (rating 3), and low (rating 1–2) skillfulness. Second, to test hypotheses that the magnitude of a specific type of transition (e.g., Explore to Change Talk – Distal) would vary by therapist skillfulness in that area (i.e., Exploration), Generalized Estimating Equations [GEE; 52] with a Gaussian probability distribution was used. Specifically, for each GEE model, repeated measures of the transitional probability between therapist and client behaviors were regressed on the relevant skillfulness rating, covarying the effect of time (i.e., session 1, 2, 3, 12/4).

Results

Rater reliability

Table One shows reliability estimates for a randomly selected subsample of 20% ($n = 47$) double-coded sessions. ICC values were ‘excellent’ for client language categories, ranging from .83 (for ST-Proximal) to .99 (for Follow/Neutral). For therapist function categories, ICCs ranged from .94 (Connect) to .99 (Explore). Kappa values for global skillfulness were . 26 (Teach) to .45 (Explore). Therefore, behavioral categories indicated excellent reliability among raters, but fair-to-moderate reliability for skillfulness measures [48,49]. Finally, utterance level absolute agreement across codes was very good (Kappa = .72).

Sequential Analyses: Overall results

Because each therapist function (Explore, Teach, Connect) is expected to impact specific client processes, we hypothesized that these predictors would have differential effects on client language outcomes. First, we expected that relative to chance, therapist exploration of change would predict greater client discussion of distal drinking and proximal coping behavior. We additionally expected the magnitude of the probability would be greater for discussion of drinking than for coping. Next, we hypothesized that therapist teaching interventions would similarly predict discussion of both drinking and coping, but with a greater probability for proximal coping than for distal drinking. Finally, given varied theorized roles for connecting interventions across modalities, we did not predict directional effects for this therapy function.

Table 2 and Figure 1 display data for therapist-to-client transitions. The full transition matrix consisted of 104,852 transitions from 484 recorded therapy sessions, which deviated significantly from a matrix of random transitions, $\chi^2(16) = 1471.26$, $p < .001$. Relative to chance, therapist Explore increased client discussion of distal drinking, while client discussion of proximal coping and non-change-related content were suppressed. The direction of these transitions did not differ by positive versus negative valence (i.e., CT vs. ST). Therapist Teach suppressed client discussion of drinking relative to chance (both CT and ST) while increasing neutral content and having no significant effect on client discussion of coping. Different from Explore and Teach, the direction of transitions from therapist Connect to client language differed by language valence. Specifically, therapist interpersonal connection significantly increased CT with respect to both drinking and coping, suppressed both neutral content and drinking ST, and had no impact on coping ST.

Sequential Analyses: Transitional Probability by Skillfulness Ratings

Transitions by Therapist Skillfulness at Exploration—Therapist exploration typically has a content focus on drinking behavior and behavior change [14,53,54], regardless of treatment modality. We expected that transitions from exploration to discussion of drinking and coping would be highest in magnitude when therapists were high in Exploratory Skillfulness, and that higher Exploratory Skillfulness would yield greater levels of CT than ST. As can be seen in Table 3, this prediction was unsupported. Specifically, skillful therapist exploration predicted distal drinking CT and ST rather than predicting distal CT and suppressing distal ST.

Transitions by Therapist Skillfulness at Teaching—Because teaching interventions typically have a focus on client proximal coping behaviors [55], we predicted that therapists rated as more skillful at teaching would elicit more CT than ST in proximal discussions. Table 3 shows this prediction was unsupported, but unexpectedly, therapists more skilled at teaching had higher transitions to distal CT and ST than did therapists less skilled at teaching.

Transitions by Therapist Skillfulness at Connecting—Therapists who are highly interpersonally skillful should engender greater openness on the part of the client [56]. Thus, we expected the effect of higher interpersonal skillfulness would manifest in the transitional probabilities of therapist Explore and Teach behaviors, and these expectations were partially supported. Transitional probabilities from therapist Explore to both distal and proximal CT were predicted by therapist Connecting Skillfulness, with more skillful therapists eliciting more CT than less skillful therapists. Therefore, connecting therapists optimized their exploratory interventions with respect to client language mechanisms, but this pattern of result was not entirely observed for teaching. Here, highly interpersonally skillful therapists elicited more distal CT and ST from teaching than less skillful therapists, while Connecting Skillfulness showed no relationship to the transitional probability from therapist Teach to proximal language.

Discussion

Although many treatments, including cognitive-behavioral-, twelve-step-, and motivation-based approaches have demonstrated similar effectiveness, little is known about how these theoretically distinct treatments produce their beneficial effects [57,58]. This phenomenon has led some to consider the importance of common factors in addictions treatment [6]. The present study adapts methodological advances, developed in the MI literature, to the study of three proposed common ingredients of behavior change therapies (i.e, Explore, Teach, Connect). Further, the crux of this study was therapeutic predictors of client verbalized decision-making in relation to drinking and coping behaviors. This is what we found.

Therapists exploring change emphasizes discussion of the target behavior— In our study, that included both motivation- and skill-based treatments, sequential probabilities showed that exploratory interventions (i.e., questions and reflections) yielded subsequent statements that were either pro- or anti-drinking, and not about coping or neutral material. This finding on clinical trial therapists is in contrast to recent findings on community therapists that show digressions from target behavior discussions are common [59]. Therefore, while the manualization movement has received critique in the United States and abroad [18,60], it provides structure to the session that may lead to particularly efficient use of the clinical time. We also expected Exploratory Skillfulness would result in *resolved ambivalence* as indicated by higher transitions from exploration to distal Change compared to Sustain Talk among higher skilled therapists. This would be particularly important given secondary analyses of Project MATCH data have recently shown that positive Change Talk to Change Talk transitions were predictive of follow-up outcomes [61]. Therefore, this type of sequential language pattern could be an indicator of decisional resolution. In the present study and consistent with what has often been found in the MI literature [21], therapist exploration appears to elicit both pro- and anti-change statements. Predictors of resolved ambivalence may be too dynamic for analytic approaches involving session-level averages or sequential associations [62,63], and may be better characterized as latent growth processes. The optimal role of the therapist in eliciting and resolving ambivalence continues to be an important puzzle for the addictions literature.

Therapists who teach may not be facilitating client verbalized decision-making around prescribed coping behaviors—This study used single lag, sequential modeling to test the effects of teaching interventions (e.g., agenda setting, discussions of homework, advising, providing psychoeducational information) on subsequent client discussion of coping behaviors. We found that under conditions of high skillfulness in teaching or connecting, greater associations to drinking speech were observed. However, teaching interventions did not yield proximal, coping change language as was predicted. In fact, among the three functions studied, only Teach increased neutral content, while Explore and Connect suppressed it. This raises numerous questions about how and where, didactic skills training impact client mechanisms of change. Research shows these interventions change behavior [64], but still little is known about the within-session predictors of the decision to engage in post-session, prescribed coping behaviors.

Yes, the relationship matters—One way coping decisions are made in behavior change interventions is through connecting interventions that affirm client strengths, autonomy, and trust. This is perhaps the most interesting finding from the present study. The only therapist function that was a predictor of subsequent coping language, and particularly pro-coping language, was therapist Connect. Further, under conditions of Skillful Connecting, Change Talk was more likely after Explore behaviors while Sustain Talk was less likely. This is consistent with recent sequential analysis work on MI, showing that affirmations in particular predicted Change Talk and suppressed Sustain Talk [65].

Limitations and Implications

This study has some limitations to consider. First, this is secondary analysis of existing clinical trial data. The nature of the MATCH study, however, presents a unique opportunity: to study three multi-session behavior change interventions that are highly representative of state-of-the-art addictions care. However, future studies should consider our hypotheses with the addition of a time-matched pseudo therapy control. Such an endeavor would allow for adequately powered tests of common- versus condition-specific effects. In this study, we tested the alternative hypothesis of condition-specific effects, and while many processes were shared, didactic therapies (CBT & TSF) are more similar than the motivation-based therapy, MET. Also related to the secondary nature of our data is the convenience sample, including the use of available session recordings. Second, our skillfulness measures showed reliability in the “fair to moderate” range. We would like to note, however, that absolute agreement kappa values for high, medium, and low values showed “good” agreement on what represented “high” skillfulness. Regardless, skillfulness results should be interpreted with some caution. The number of hypotheses tested necessarily increases the probability of Type I error. Finally, sequential modeling attempts to enhance cause-effect conclusions by testing associations occurring in a temporal sequence. While the therapist *causes* the client to behave in certain ways, the reverse is very often also true.

Conclusions

The present study yields interesting findings regarding therapist predictors of subsequent client change language in three evidence-based behavior change interventions. Because client language has demonstrated predictive validity regarding behavior change, this highlights the importance of skillful exploration and connection as key interventions to elicit this mechanism of change. The way in which teaching interventions operate to predict subsequent within-session processes warrants further study.

Acknowledgments

This research was supported by a Career Development Award (K23-AA018126) from the National Institute on Alcohol Abuse and Alcoholism. This work is, however, the sole responsibility of the authors and does not reflect the positions of the National Institutes of Health. The authors would also like to thank Cydney Dupree and Ayla Durst for their excellent coding work.

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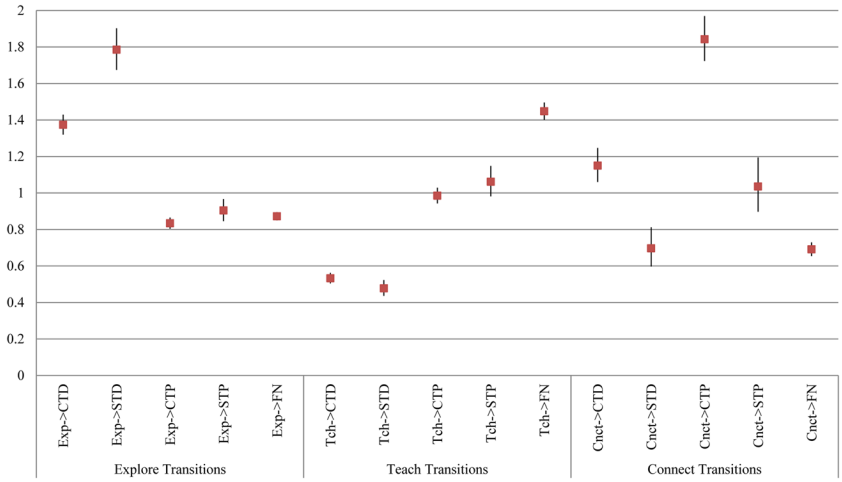

Figure 1.
Odds ratios and 95% confidence intervals for therapist-to-client transitions

Table 1

Reliability and Descriptive Information

AIMS						
Code	ICC[1]	Kappa	Min	Max	Mean[2]	(SD)
Explore	.99	-	8	398	130.15	(62.78)
Teach	.98	-	10	214	79.14	(38.95)
Connect	.94	-	0	68	22.9	(13.90)
CLA-PD						
Change Talk-Distal	.89	-	0	133	35.96	(23.26)
Sustain Talk-Distal	.94	-	1	157	41.24	(25.63)
Change Talk-Proximal	.95	-	0	94	14.40	(15.26)
Sustain Talk-Proximal	.83	-	0	105	12.03	(12.03)
Follow/Neutral	.99	-	34	468	168.33	(70.51)
Utterance-level Agreement		.72				
Skillfulness						
Explore	.63	**.45**[3]	1	5	3.11	(.80)
Teach	.42	**.27**[3]	1	5	3.03	(.75)
Connect	**.58**	**.39**[3]	1	5	3.09	(.89)

[1] Reliability estimates based on $N = 47$ double-coded sessions.

[2] Descriptive data based on $N = 484$.

[3] Secondary reliability analyses of absolute agreement at high, medium, low skillfulness showed good agreement on high skillfulness.

Notes. Ciccetti (1994) suggests the following guidelines for assessing reliability of observational coding systems: ICC of .75 or above = excellent; .60–.74 = good; .40–.59 = fair; below .40 = poor. Landis & Koch (1977) suggest the following for assessing interrater agreement via Cohen's Kappa: below 0.0 Poor; 0.00 – 0.20 Slight; 0.21 – 0.40 Fair; 0.41 – 0.60 Moderate; 0.61 – 0.80 Substantial; 0.81 – 1.00 Almost perfect. Fair and poor items are shown in **bold.**

Table 2

Transitional probabilities and odds ratios

						95% CI for OR	
Transition	**Observed frequency**	**Transition probability**	***p***	**Expected frequency**	**OR**	**Lower**	**Upper**
Explore→CTD	6466	0.12†	<.001	5686.68	1.37	1.32	1.42
Explore→STD	2776	0.05†	<.001	2198.69	1.78	1.67	1.90
Explore→CTP	6092	0.11*	<.001	6604.81	0.83	0.80	0.87
Explore→STP	1723	0.03*	<.01	1809.09	0.90	0.85	0.97
Explore→FN	36694	0.68*	<.001	37451.70	0.87	0.85	0.90
Explore Summaries:							
Explore→Drinking	9242	0.17†	<.001	7885.38	1.52	1.47	1.57
Explore→Coping	7815	0.14*	<.001	8413.91	0.84	0.81	0.87
Teach→CTD	1621	0.07*	<.001	2584.08	0.53	0.50	0.57
Teach→STD	555	0.02*	<.001	999.11	0.48	0.44	0.52
Teach→CTP	2971	0.12	.50	3001.29	0.99	0.94	1.03
Teach→STP	859	0.04	.13	822.07	1.06	0.98	1.15
Teach→FN	18419	0.75†	<.001	17018.44	1.45	1.40	1.50
Teach Summaries:							
Teach→Drinking	2176	0.09*	<.001	3583.20	0.50	0.47	0.52
Teach→Coping	3830	0.16	.894	3823.27	1.00	0.96	1.04
Connect→CTD	705	0.12†	<.001	627.48	1.15	1.06	1.25
Connect→STD	174	0.03*	<.001	242.60	0.70	0.60	0.81
Connect→CTP	1176	0.20†	<.001	728.78	1.84	1.72	1.97
Connect→STP	206	0.03	.63	199.61	1.04	0.90	1.19
Connect→FN	3670	0.62*	<.001	4132.50	0.69	0.65	0.73
Connect Summaries							
Connect→Drinking	879	0.15	.736	870.09	1.01	0.94	1.09
Connect→Coping	1382	0.23†	<.001	928.41	1.70	1.59	1.81

Notes.

† More probable than chance.

* Less probable than chance. Sensitivity analyses were conducted to assess reverse causality (client-to-therapist transitions), and the general pattern of findings was consistent but transition magnitudes were typically lower.

Table 3

Results of Generalized Estimating Equations

Skill Measure	Transition	Medium Skill			High Skill			Time[1]		
		B	***SE***	***P***	***B***	***SE***	***P***	***B***	***SE***	***P***
Exploration										
	Explore->CT Distal	.008	.009	.364	**.032**	**.012**	**.007**	.007	.004	.091
	Explore->ST Distal	**.018**	**.009**	**.039**	**.044**	**.011**	**<.001**	−.021	.124	.091
	Explore->CT Proximal	−.004	.015	.781	.018	.014	.208	**.032**	**.003**	**<.001**
	Explore->ST Proximal	.002	.006	.772	.005	.007	.425	**.008**	**.002**	**<.001**
Teaching										
	Teach->CT Distal	**.026**	**.009**	**.003**	**.021**	**.009**	**.020**	.006	.005	.203
	Teach->ST Distal	−.001	.004	.772	**.042**	**.011**	**<.001**	**−.007**	**.003**	**.018**
	Teach->CT Proximal	−.015	.010	.152	−.013	.012	.280	**.021**	**.004**	**<.001**
	Teach->ST Proximal	−.002	.007	.798	.006	.008	.483	**.009**	**.002**	**<.001**
Connecting										
	Explore->CT Distal	**.017**	**.008**	**.031**	**.026**	**.011**	**.016**	.009	.005	.090
	Explore->ST Distal[2]	**.057**	**.018**	**.001**	**.024**	**.001**	**.026**	−.023	.015	.125
	Explore->CT Proximal	**.020**	**.008**	**.016**	**.033**	**.009**	**<.001**	**.031**	**.003**	**<.001**
	Explore->ST Proximal	−.008	.005	.077	−.009	.006	.154	**.008**	**.002**	**<.001**
	Teach->CT Distal	.001	.007	.921	**.021**	**.010**	**.035**	.005	.004	.225
	Teach->ST Distal	.007	.004	.091	**.026**	**.012**	**.025**	−.010	.008	.223
	Teach->CT Proximal	−.012	.011	.275	<.001	.012	.997	**.021**	**.004**	**<.001**
	Teach->ST Proximal	−.007	.006	.245	−.009	.007	.188	**.010**	**.002**	**<.001**

Notes. For all categories, low skillfulness is used as reference. Significant effects shown in **bold**.

[1]Time measured via session number

[2]Model did not reach convergence, but secondary model with log transformation converged, yielding the same results. Sensitivity analyses were conducted to test the alternative hypothesis of treatment-specific therapist-to-client transitions, using treatment condition as the moderator in GEE models. These analyses showed CBT and TSF demonstrate more similar patterns of transition than MET (i.e., these conditions are more characterized by Teach rather than Explore behaviors).