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Patient motivation in group metacognitive therapy for generalized anxiety disorder

ESPEN R. LASSEN [1], MOURAD TOUIL[1], TONE L. SVENDSEN[1], SVEIN HASETH [2], & STIAN SOLEM [1]

[1]*Department of Psychology, Norwegian University of Science and Technology, Trondheim, Norway &* [2]*Nidaros DPS, St. Olavs Hospital, Trondheim, Norway*

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Abstract

Objective: The aim of this study was to investigate the predictive value of motivational language (change talk [CT] and sustain talk [ST]) on treatment outcome of group metacognitive therapy (g-MCT) for generalized anxiety disorder (GAD).
Method: Video recordings of the first, fourth, and seventh therapy sessions (55 patients) were encoded using the Motivational Interviewing Skill Code (MISC) manual. The strength of the patients' motivational utterances was encoded as CT or ST with seven subcategories.
Results: The strength of CT-utterances and ST-utterances differed significantly between treatment responders and non-responders as therapy progressed. The strength of ST-utterances increased significantly more among non-responders than responders, whereas CT and positive *taking steps* utterances increased more among treatment responders than non-responders. CT and ST in session 1 were not associated with treatment outcome. CT and ST in sessions 4 and 7 significantly predicted lower and higher worry-scores at post-treatment, respectively. This effect was particularly evident for *taking steps* utterances in session 7.
Conclusion: These findings confirm the predictive value of MISC in sessions 4 and 7 of g-MCT for GAD and highlight the importance of therapists addressing patient motivation.

Keywords: anxiety; cognitive behavior therapy; process research

Clinical or methodological significance of this article: This study assessed patients' motivation in group metacognitive therapy for generalized anxiety disorder. Motivation changes throughout the course of therapy. Change talk in sessions 4 and 7 predicted less worry, whereas sustain talk was associated with more worry. More specifically, patients expressing that they were taking steps (challenging their problems) had better treatment outcomes. These findings suggest that the therapists should be attentive and address motivation.

Generalized anxiety disorder (GAD) is one of the most prevalent anxiety disorders, with an annual and lifetime prevalence of 3.1% (Kessler et al., 2005) and 14% (Moffitt et al., 2010), respectively. The disorder is characterized by excessive and uncontrollable worry about a multitude of events or activities, lasting for 6 months or longer (American Psychiatric Association [APA], 2013). GAD is associated with significantly reduced quality of life, tends to remain chronic unless treated (APA, 2013; Spitzer et al., 2006), and places a great burden on the society at large (Wittchen, 2002).

Cognitive behavioral therapy (CBT) is the most empirically validated psychological intervention for

*Corresponding concerning this article should be addressed to Stian Solem, Department of Psychology, Norwegian University of Science and Technology, Trondheim, Norway. Email: stian.solem@ntnu.no

GAD(Cuijpers et al., 2016). Approximately 50% of patients respond to treatment (Hanrahan et al., 2013; Hunot et al., 2007), and 50–60% of patients remain recovered at 6-month follow-up (Fisher & Durham, 1999). Metacognitive therapy (MCT; Wells, 2009) might be a viable treatment option, as a meta-analysis reported recovery rates ranging from 72% to 80% (Normann & Morina, 2018). Less is known about metacognitive group therapy (g-MCT). However, three open trials of g-MCT for GAD have revealed promising results (Haseth et al., 2019; McEvoy et al., 2015; van der Heiden et al., 2013). The main difference between Beckian CBT and MCT is that CBT for GAD includes detecting cues that trigger worry, applied relaxation, and challenging specific cognitions with cognitive restructuring and coping rehearsal. Contrastingly, MCT does not address worry content as the aim is to leave worry thoughts alone and modify metacognitive beliefs about cognition. As a whole, these premises establish the necessity of developing and refining effective psychological treatments for GAD. Consequently, treatment process research is warranted.

Patient motivation for change is commonly regarded as an important prognosticator of the treatment outcome (Antony et al., 2005). Specific to GAD, patient characteristics of low motivation and ambivalence towards renouncing worry is proposed to inhibit treatment response (Arkowitz & Westra, 2004; Borkovec & Roemer, 1995). According to a metacognitive model of GAD, patients hold both positive and negative metacognitive beliefs about worry (Wells, 2009), which might contribute to ambivalence (i.e., inconsistent motivation) towards relinquishing their worries. Thus, investigating patients' motivation for change might be fruitful in treatment process research of MCT for GAD. Such research might contribute to developing and refining effective psychological GAD interventions.

However, reliable assessment of patient motivation has proven challenging. Motivation has commonly been assessed using self-report measures, but results have been inconsistent (e.g., Solem et al., 2016; Vogel et al., 2006). Self-reported motivation could be prone to social desirability bias, leading to ceiling effects. An alternative measurement of patient motivation is the Motivational Interviewing Skill Code (MISC; Glynn & Moyers, 2009). The MISC version 2.5 (Houck et al., 2011) is an observation-based coding manual, which quantifies in-session motivational language, regarding a given target behavior, into seven categories: *Commitment, reason*, *taking steps, ability*, *desire*, *need*, and *other*. *Commitment* relates to statements that the patient is planning to change (or sustain) the problem behavior (e.g., "I'll try to postpone worry this week"). *Reason* concerns specific reasons for changing one's problem behavior (e.g., "Worrying is destroying my life"). *Taking steps* refers to recent actions undertaken to challenging the problem (e.g., doing homework assignments), whereas *ability* concerns the patients' belief in their capacity to deal with the problem. Figure 1 displays example utterances of each category. In addition, each sequence of motivational language is encoded as either *change talk* (CT; statements in favor of changing the target behavior) or *sustain talk* (ST; statements in favor of maintaining the target behavior; Houck et al., 2011).

In motivational interviewing (MI; that is, the technical MI-hypothesis), CT is hypothesized to predict successful patient change of a particular target behavior (e.g., reducing worry), whereas ST is proposed to be inversely related to target behavior change (e.g., sustaining worry; Miller & Rose, 2009). As accentuated by Miller & Rose (2009), the hypothesized change-advancing effects of CT, as well as the change-impeding effects of ST, are rooted in self-perception theory (Bem, 1967) and cognitive dissonance theory (Festinger, 1962). In accordance with the technical MI-hypothesis, ST, and CT/ST-ratio (i.e., low CT and high ST) are consistently associated with unsatisfactory outcomes of MI for substance use and problematic health behaviors (Magill et al., 2018; Pace et al., 2017). However, these meta-analyses did not find CT to consistently predict better outcomes in such studies.

Even though the MISC is primarily used to predict outcomes of MI for substance-related disorders, some recent studies have applied it to psychotherapy research of GAD. Lombardi et al. (2014) encoded 37 patients' CT and ST in session 1 of CBT for GAD. Their main results revealed that the frequency of ST (not CT) in session 1 predicted higher post-treatment worry scores and discriminated treatment responders from non-responders ($d = 0.96$). Similar studies have yielded comparable results, confirming that the frequency of ST (not CT) in early therapy sessions of CBT for GAD predicts higher levels of worry at post-treatment and/or follow-up (Button et al., 2015; Sijercic et al., 2016).

A few studies have also found support for CT as a valid prognosticator of treatment outcome for patients with GAD. In a trial of CBT versus MI-integrated CBT, Poulin et al. (2019) found that CT in session 1 predicted reduced worry scores at follow-up. Furthermore, Goodwin et al. (2019) found CT in session 1 to be indicative of a greater likelihood of and faster response time to treatment, whereas more ST was associated with reduced likelihood of and slower response to treatment. Moreover, a

Motivational utterance	Category	Strength
I have tried to prepare for work without worrying.	Taking steps	2
I am trying really hard to reduce the time I spend worrying.	Taking steps	4
Since the last session, I have not made a single effort to reduce my worry.	Taking steps	-4
I don't bother to be observant of my trigger thoughts.	Taking steps	-3
I am still using several maladaptive coping strategies.	Taking steps	-4
I know I am able to reduce my worry. This is doable.	Ability	3
Given my history of worrying, I will never ever be able to stop.	Ability	-5
I am able to control my worrying.	Ability	2
Worrying makes me stressed.	Reason	2
Worrying helps me to get stuff done, make decisions and prepare for work.	Reason	-3
My life would be significantly better if I worry less.	Reason	3
Excessive worrying will give me a heart attack or make me seriously ill.	Reason	4
I am going to worry less as of tomorrow.	Commitment	3
I am never going to stop worrying.	Commitment	-4
I want to be able to go on holiday with my family without worrying.	Desire	4
I want to continue worrying.	Desire	-3
If I were to move back home, I could stop worrying.	Other	2
Worrying has not caused me any emotional problems.	Other	-3
I don't need to worry anymore.	Need	3
I need to worry every day.	Need	-4

Sum scores for MISC categories

	Reason	Commitment	Ability	Taking steps	Desire	Other	Need	CT	ST
+	9	3	5	6	4	2	3	32*	
-	3	4	5	11	3	3	4		33*
Sum	6	-1*	0	-5*	1	-1	-1		

Figure 1. The current study's coding system utilized MISC 2.5 (Houck et al., 2011) combined with Miller and colleagues' (2003) strength-coding-procedures. Each patient utterance was coded as belonging to one of seven MISC categories, with values from −1 to −5 indicating ST and +1 to +5 indicating CT. CT and ST scores were added up for each category, as displayed in the bottom of the figure. CT: change talk; ST: sustain talk; +: CT; −: ST. *The variables included in the current study's analyses.

recent study found that ST predicted a lower probability of reliable improvement, while CT predicted a higher probability of improvement, among 34,000 patients treated with internet-based CBT (primarily for depression and GAD; Ewbank et al., 2020).

The role of motivation in g-MCT is unknown, but interaction with other patients could potentially increase motivation (e.g., normalization of symptoms and beliefs, encouragement, and behavioral modeling). On the contrary, some elements could activate ambivalence as patients could worry about meeting new people, sharing their problems, and being negatively judged. It is, therefore, likely that the presence of other group members could impact clients' motivational utterances as social desirability and group cohesion effects could be at play. Recently, Joramo et al. (2021) investigated the role of patient motivation in a CBT versus MCT trial of GAD. The study MISC-encoded both sessions 1 and 4, in addition to the seven categories of the motivational language specified in MISC 2.5 (Houck et al., 2011). The results revealed that CT in session 4 predicted lower worry scores at post-treatment and 2-year follow-up. Furthermore, positive *commitment* utterances in session 1 and positive *taking steps* utterances in session 4 predicted favorable treatment outcome. What's more, patients uttered significantly more motivational language in session 1 of the MCT condition compared to the CBT condition. There were no significant differences between the two conditions regarding motivational language in session 4.

In summary, these findings establish both ST and CT as valid predictors of treatment outcome in CBT and MCT for GAD, although CT appears less consistent than ST. Nevertheless, further exploration of patterns of motivational language over the course of therapy, and its relation to treatment outcome, is required (e.g., Goodwin et al., 2019; Lombardi et al., 2014). This line of research warrants further investigation, as motivational language at specific moments of therapy may be more powerful clinical predictors than others (Pace et al., 2017).

This study expands upon previous research in several ways. It investigates motivational language in a group metacognitive therapy (g-MCT) setting. To date, only Joramo et al. (2021) have investigated motivational language in an MCT setting. Additionally, MISC research in the context of group therapy is limited. Only one study of group CBT for mixed anxiety disorders (Marker et al., 2019), and another of group MI for substance-related disorders (D'Amico et al., 2015), have been conducted. Hence, the predictive validity of the MISC in MCT and group therapy has not been adequately researched.

Only Joramo et al. (2021) have utilized all seven categories of motivational language in their MISC-coding procedures. As these categories might reveal important nuances in the predictive validity of motivational utterances, we also applied such encoding procedures. To further refine the measurement of motivational statements, we assessed the strength of such utterances (as opposed to merely frequency; Miller et al., 2003). This has been done in the substance disorder domain (e.g., Amrhein et al., 2003; Gaume et al., 2013), but until now, not in GAD research. This study is the first to have examined longitudinal patterns of the motivational language across three therapy sessions for GAD (sessions 1, 4, and 7).

Hinged on the presented theory and empiricism, we hypothesized that CT and ST in sessions 1, 4, and 7 are associated with worry scores at post-treatment and follow-up. More specifically, based on findings from Joramo et al. (2021), we expected CT (including positive *commitments* and *takings steps)* to predict less worry while ST to predict more worry. The theoretical background for this hypothesis is the transtheoretical model of health behavior change (Prochaska & Velicer, 1997). Commitment utterances could indicate that the patient is moving from the precontemplation and contemplation stages to the preparation stage while taking steps utterances suggest that the patient is entering the action phase. Furthermore, we expected a significant difference in change of MISC scores across sessions 1, 4, and 7 between treatment responders and non-responders.

Method

Participants

Ninety-two patients were assessed for eligibility, and 37 were excluded. Exclusion criteria were severe somatic illness, psychosis, post-traumatic stress disorder, known cluster A or B personality disorder, suicidality, and drug addiction. The most common reason for exclusion was that GAD was not the primary disorder ($n = 16$). In addition, 10 patients preferred individual treatment, 7 could not attend due to practical difficulties in attending the sessions, 2 were given inpatient treatment, and 2 were excluded due to somatic disorders. Four did not complete assessment at post-treatment and eight did not attend 3-month follow-up assessment. No patients dropped out of treatment.

In total, the sample consisted of 55 patients, of whom 45 (81.8%) were female. The average age was 32.13 years ($SD = 9.33$). Several patients had comorbid disorders, with obsessive-compulsive disorder (27.3%) and major depressive disorder (25.5%) being the most common. Further demographic and diagnostic characteristics are displayed in Table I. All patients were aged 18 years or older with GAD as their primary diagnosis, established using the Anxiety Disorders Interview Schedule IV (ADIS-IV; Brown et al., 1994).

Procedure

We obtained video recordings from Haseth and colleagues' study (2019) of g-MCT for GAD. The sample size is somewhat larger than the one in the original publication (Haseth et al., 2019; see "treatment and therapists-section"). Patients were referred to Nidaros DPS, a public outpatient mental health clinic at St. Olavs Hospital in Trondheim, Norway.

Table I. Demographic and diagnostic characteristics of the sample ($N = 55$).

Demographics	*n*	%
Female	45	81.8
Married/cohabitant	39	70.9
Single	15	27.3
Separated/divorced	1	1.8
Full time employed	27	49.1
Student	14	25.5
Welfare benefits	14	25.5
Current use of psychopharmaceutic medication	15	27.3
Comorbidity		
Obsessive-compulsive disorder	15	27.3
Major depressive disorder	14	25.5
Social anxiety disorder	7	12.7
Agoraphobia	4	7.3
Specific phobia	5	9.1
Panic disorder	3	5.5
Health anxiety	2	3.6
Trichotillomania	1	1.8
Body dysmorphic disorder	1	1.8

Note: Welfare benefits included being on sick leave, receiving work assessment allowance, and receiving disability benefits. Psychopharmaceutic medication included antidepressants, anxiolytics, and hypnotics.

Referrals were made by either the patients' GP, student health services, or other mental health clinics. All patients provided informed consent. The study was approved by the Regional Committee for Medical and Health Research Ethics in Norway (2013/2155). In total, there were 11 groups with 4 −7 patients in each group. All groups received 10 weekly group sessions of g-MCT, with a duration of 90 min. The therapy was conducted at Nidaros DPS from 2013 to 2018.

Recordings of sessions 1, 4, and 7 were coded for each patient. The coders were three graduate students from the clinical psychology program at the Norwegian University of Science and Technology. They were kept blind to the treatment outcomes throughout the coding process. Prior to coding, the coders attended a stringent training program consisting of two 4-hr seminars with the study's senior researcher and instructional coding of the test material. To ensure adequate inter-rater agreement before coding of the study material, the senior investigator observed all the coded test tapes and approved the instructional coding. Inter-rater reliability was estimated by double-coding a 10% random selection of the study's video material. Analyses were carried out with two-way mixed, absolute agreement, intraclass correlation coefficients (ICCs). ICCs were 0.934 ($p < .001$, 95% CI [0.816, 0.977]) for CT, and 0.953 ($p < .001$, 95% CI [0.866, 0.983]) for ST, indicating excellent inter-rater agreement (Koo & Li, 2016). The lower bounds of the confidence intervals fall within the range of good inter-rater agreement.

Treatment and Therapists

The treatment modality was g-MCT for GAD based on the manual of Wells (2009), with some modifications to make it more suitable for the group format. The metacognitive model of GAD is developed based on the Self-Regulatory Executive Function model (S-REF; Wells, 2009). It postulates that GAD is a result of maladaptive metacognitive beliefs about worry and the employment of dysfunctional coping strategies in response to worry triggers. According to the model, individuals suffering from GAD typically respond to triggers with prolonged worry, because they think it will make them more prepared, help them find a solution, and so forth. Such appraisals are termed positive metacognitive beliefs. Paradoxically, they often have negative metacognitive beliefs about worry as well, believing worry is harmful and uncontrollable. To cope, they try to limit their worries through maladaptive behaviors (e.g., avoiding upsetting stimuli, seeking reassurance from friends) or thought processes (e.g., trying to suppress or distract ones' worries). However, these strategies are largely ineffective and lead to more worry. Ultimately, all of this causes significant distress and functional impairment (Wells, 2009).

MCT attempts to help clients by altering their metacognitions about worry and related maladaptive coping strategies. This is achieved by socializing clients to the model, Socratic questioning, and behavioral experiments. MCT also introduces a new and more adaptive strategy for coping with worry called detached mindfulness (Wells, 2009). Instead of trying to suppress or distract from worry triggers, detached mindfulness entails being aware of these triggers and not doing anything to take care of them.

In session 1, patients created a group case formulation, in addition to a personal case formulation (Haseth et al., 2019). Patients were socialized to the metacognitive model of GAD and detached mindfulness. Negative metacognitions regarding uncontrollability of worry, and losing control as a consequence of worrying, were addressed and challenged in session 4. In session 7, the primary focus was to challenge and modify positive metacognitive beliefs about worry, as well as addressing remaining negative metacognitions. The first 25 min of sessions 4 and 7 typically consisted of dialogue regarding homework and how each patient had been since the last therapy session. Motivation for change was not addressed directly in treatment. However, patients were asked about the credibility of their metacognitions, which often resulted in utterances relating to their willingness to change these assumptions and to stop worrying.

All sessions were led by two therapists (acting as therapist and co-therapist): a psychiatric nurse and a clinical psychologist, registered as level 1 and level 2 MCT-therapists, respectively. Video recordings of therapy sessions were monitored by a master clinician in MCT to ensure adherence to the principles of the manual. The first five groups were pilot groups used for the therapists to familiarize themselves with the administration of g-MCT and optimize adaptation to the group format. These groups were not included in the Haseth et al. (2019) publication but were included in this study to increase the sample size.

Measures

Penn State Worry Questionnaire (PSWQ). The PSWQ (Meyer et al., 1990) is a 16-item self-report measure of worry severity. Worry is measured in terms of frequency, intensity, and

uncontrollability. PSWQ scores range from 16 to 80, with higher scores indicating more severe symptoms. PSWQ has demonstrated excellent validity, reliability, and internal consistency (Meyer et al., 1990). It was the primary outcome measure in this study.

Motivational Interview Skill Code version 2.5 (MISC 2.5). We utilized the MISC 2.5 (Houck et al., 2011) to quantify patients' motivational language into seven categories: *Commitment, reason, desire, ability, need, taking steps,* and *other.* Utterances related to the specified target behaviors were given a valence indicating a readiness to change (CT) or opposition to change (ST). Strength of motivational language was encoded using a −5 (ST) to +5 (CT) scale, in accordance with Miller et al. (2003). Figure 1 displays the utilized coding system, as well as motivational utterances from the sample with corresponding codes. It also displays the data handling of the codes. Statements that did not pertain to change of the target behavior (e.g., *follow/neutral/ask*) were left uncoded. Compliance of in-session practice of metacognitive techniques were not coded unless patients spontaneously reported motivational utterances before or after the exercises. Worry, metacognitions, and maladaptive coping behaviors were the defined *target behaviors*.

Statistical Analyses

We applied three hierarchical regression models to explore predictive value of motivational language. All models controlled for age and gender on step 1, and PSWQ baseline scores on step 2. Models 1 and 2 tested the predictive capacity of CT and ST in sessions 4 and 7. Model 3 tested the predictive validity of *commitment* in session 1 and *taking steps* in sessions 4 and 7.

Intraclass correlation coefficients (ICCs) were calculated to account for group effects. A high ICC (close to 1) indicates within-group homogeneity in the specified variable, while a low ICC (close to 0) indicates within-group heterogeneity in the variable in question (Kivlighan et al., 2020). The three regression models were repeated using group-mean centered scores for the MISC variables to further examine possible group effects. For these analyses, the individual's MISC scores were subtracted from the group's mean MISC score.

Finally, we administered three two-way repeated-measures ANOVAs with *post hoc* tests, to compare changes in motivation across sessions 1, 4, and 7 for treatment responders and non-responders. Treatment response at post-treatment was computed in accordance with Jacobson and Truax (1991) and Fishers (2006) criteria for clinically significant change (CSC) on the PSWQ (i.e., recovery): cut-off = 47 and reliable change index = 7. Furthermore, in cases where Mauchly's tests were significant at $p < .05$, indicating violation of the assumption of sphericity, corrected *F*-statistics were applied. In these instances, none of the Greenhouse–Geisser ε – estimates were <0.75. Hence, Huynh–Feldt corrected *F*-statistics were applied. Effect sizes were calculated using Partial Eta Squared (η_p^2). An effect of .03, .13, and .26 was considered as small, moderate, and large, respectively (Bakeman, 2005).

Five patients had missing follow-up scores, and four patients had missing post-treatment scores. To investigate the effect of missing data, statistical analyses were tested using raw data only, multiple imputation, and data imputed based on an algorithm considering available data these patients had on GAD-7 (Spitzer et al., 2006), GAD-S (Wells, 2009), and PHQ-9 (Kroenke et al., 2001). Imputation methods for all analyses are specified in the notes of the following tables and figures. For all analyses involving MISC-measures in sessions 1 and 4, data from all 55 patients were analyzed (and 54 for session 7).

Results

Motivational Language across Sessions and Effects of Group Membership

Mean values for the outcome measure PSWQ were 70.02 ($SD = 6.55$) at pretreatment, 42.89 ($SD = 13.81$) at post-treatment, and 41.64 ($SD = 14.97$) at follow-up. Table II displays descriptive statistics for the strength of motivational language. The strength of CT was approximately twice as large as for ST in all sessions. Concerning the motivational categories, there was a relatively high strength of positive *reasons*, negative *ability*, and positive *other* in session 1. *Taking steps* and *ability* utterances increased across sessions. *Reason* utterances showed a V-shape across sessions. The categories *need* and *desire* were rarely reported. Table II also displays the average number of motivational utterances per patient in session 1 ($M = 14.05$, $SD = 6.60$), 4 ($M = 13.36$, $SD = 6.16$) and 7 ($M = 22.02$, $SD = 7.78$). For an overview of the correlations between MISC scores and treatment outcome, see supplemental Table 1.

A summary of the three regression models is presented in Table III. Model 1 found CT and ST in session 4 to predict less and more worry at post-

Table II. Descriptive statistics for the strength of motivational language in session 1, 4, and 7.

	Session 1		Session 4		Session 7	
	M	*SD*	*M*	*SD*	*M*	*SD*
CT	24.76	12.13	25.29	13.92	41.13	19.12
ST	14.11	8.18	12.22	9.05	19.43	14.61
Taking steps	0.49	2.07	4.93	8.75	6.35	13.83
Ability	−7.05	6.53	−2.16	5.57	−2.57	5.70
Reason	9.05	8.82	3.64	4.60	8.91	9.97
Commitment	0.16	2.20	2.35	3.62	2.87	3.24
Other	6.91	4.83	3.27	4.08	4.30	6.77
Desire	0.69	1.56	0.24	0.86	1.07	2.02
Need	0.20	0.85	0.13	0.58	0.78	1.70
Frequency/patient	14.05	6.60	13.36	6.16	22.02	7.78

Notes: CT: change talk; ST: sustain talk; freq.: frequency. "Frequency/patient" corresponds to the average number of motivational utterances (all categories and valences) per patient.

Table III. Predicting post-treatment worry-scores using motivational utterances.

	F	*p*	$R^2_{adj.}$	$R^2_{cha.}$	*B*	*SE*	*t*	*p*
Model 1 – Session 4								
1. Age and sex	2.98	.061	.08	.12				
2. PSWQ pre	2.54	.068	.09	.03				
3. CT	3.19	.022	.16	.08*				
4. ST	5.46	.001	.32	.17**				
Age					0.48	0.18	2.65	.008
Sex					6.44	4.73	1.36	.175
PSWQ pre					0.26	0.33	0.79	.437
CT					−0.30	0.13	−2.38	.018
ST					0.51	0.19	2.66	.008
Model 2 – Session 7								
1. Age and sex	3.34	.044	.09	.13*				
2. PSWQ pre	2.80	.051	.11	.03				
3. CT	4.39	.005	.23	.13**				
4. ST	6.57	<.001	.38	.15**				
Age					0.35	0.18	1.95	.052
Sex					4.95	4.42	1.12	.265
PSWQ pre					0.05	0.30	0.17	.865
CT					−0.21	0.10	−2.20	.031
ST					0.36	0.11	3.28	.001
Model 3 – categories								
1. Age and sex	3.34	.044	.09	.13*				
2. PSWQ pre	2.80	.051	.11	.03				
3. *Commitment* T1	3.86	.009	.20	.11*				
4. *Taking Steps* T4	5.89	<.001	.35	.15**				
5. *Taking Steps* T7	7.88	<.001	.54	.12**				
Age					0.40	0.18	2.29	.022
Sex					3.44	4.26	0.81	.421
PSWQ pre-treatment					0.19	0.32	0.59	.559
Commitment Sess. 1					−1.09	0.72	−1.51	.132
Taking steps Sess. 4					−0.44	0.20	−2.15	.033
Taking steps Sess. 7					−0.37	0.12	−3.06	.002

Note: Sess.: session number; pre: pre-treatment; CT: change talk; ST: sustain talk; PSWQ: Penn State Worry Questionnaire. For all analysis, strength scores were used as predictor variables. Analyses based on multiple imputation. The significant findings were replicated when using non-imputed data. $^*p < .05$, $^{**}p < .01$

treatment, respectively. Similarly, model 2 established CT and ST in session 7 as significant predictors of lower and higher post-treatment worry, respectively. Finally, in model 3, *commitment* in session 1 along with *taking steps* in sessions 4 and 7, all significantly explained the variance in post-treatment worry. However, *taking steps* in sessions 4 and 7 were the only significant predictors in the final

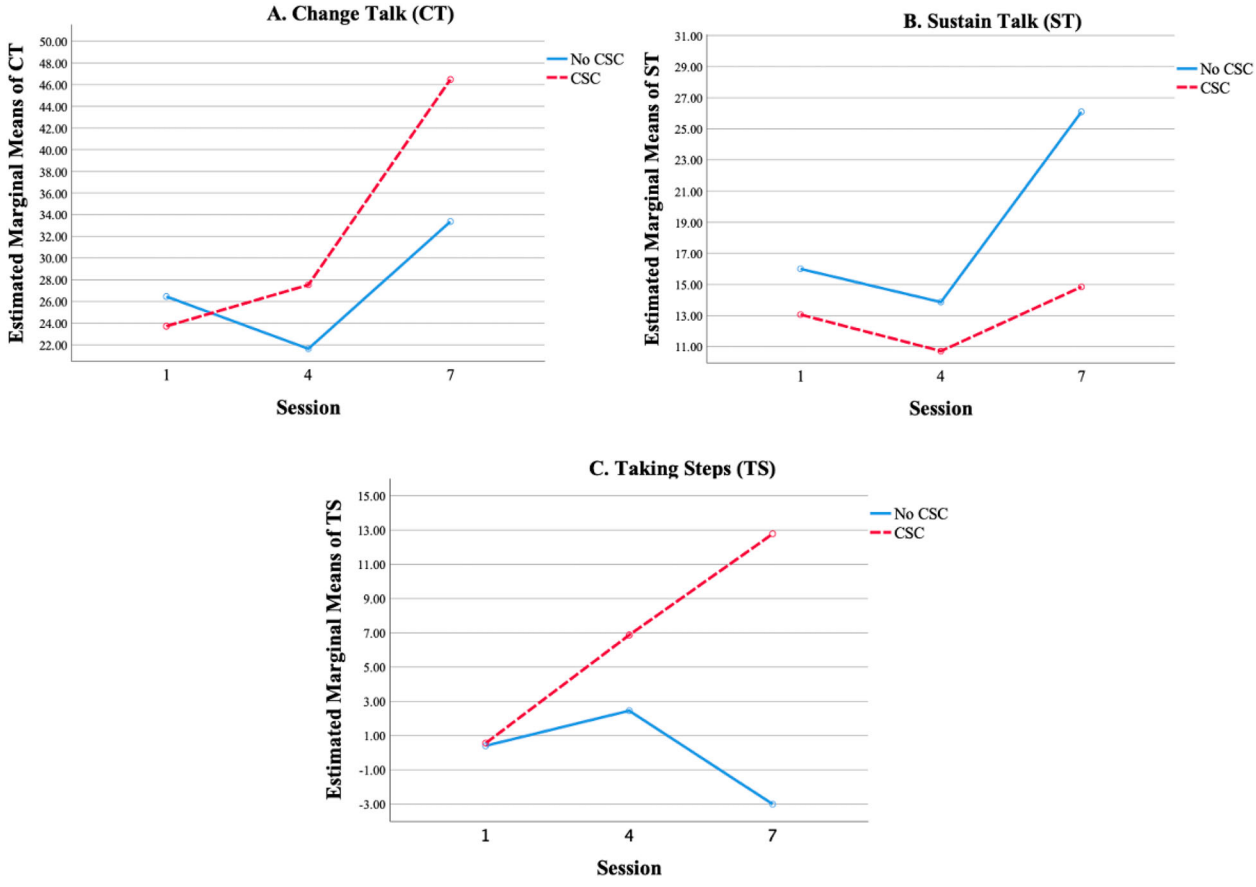

Figure 2. Graphs of estimated marginal means in motivational language across sessions, for treatment responders (CSC) and non-responders (No CSC). MISC strength scores were the dependent variable in all analyses. These significant results were found both when using imputed and non-imputed data.

step of the equation. Positive *taking steps* predicted less worry. The amount of explained variance for the three models ranged from 32% to 54%. Durbin-Watson values were within normal range from 1.68 to 1.99. VIF-values ranged from 1.03 to 1.28, indicating no issues regarding multicollinearity.

We calculated ICCs for CT-score and ST-score in sessions 4 and 7. For ST, the ICCs were 0.012 in session 4 and 0.072 in session 7. Regarding CT, the ICCs were 0.368 in session 4 and 0.168 in session 7. The ICC for PSWQ was 0.129. None of the MISC variables were significant predictors of treatment outcome when re-analyzing the three regression models using group-mean centered scores.

Differences in Motivational Language between Treatment Responders and Non-responders

Concerning changes in CT, there was a large, significant effect of time (F [2, 104] = 22.22, $p < .001$, η_p^2 = .30). CT increased across sessions. Additionally, we found a small, significant interaction effect between time and group on CT-scores (F [2, 104] = 4.61, $p = .013$, $\eta_p^2 = .08$). Thus, treatment responders and non-responders differed in their amount of change in CT across sessions. Responders' CT-scores increased further than the non-responders' CT scores(see Figure 2(A)).

For changes in ST, the analyses revealed a significant, moderate effect of time (F [2, 104] = 13.01, $p < .001$, $\eta_p^2 = .20$). Also, we found a small, significant interaction effect between time and group on ST-scores (F [2, 104] = 4.09, $p = .021$, $\eta_p^2 = .07$). Consequently, treatment responders and non-responders differed in their degree of change in ST across sessions. Treatment responders expressed less ST across sessions compared to non-responders (see Figure 2(B)).

Finally, there was a small, significant effect of time on *taking steps* scores (F [1.77, 91.78] = 4.85, $p = .013$, $\eta_p^2 = .09$). Additionally, the results revealed a moderate, significant interaction effect between time and group on *taking steps*-scores (F [1.77,

91.78] = 12.86, $p < .001$, $\eta_p^2 = .20$). Treatment responders and non-responders differed in their amount of change in *taking steps* across sessions. Responders expressed more positive *taking steps* utterances across sessions than non-responders (see Figure 2(C)). No significant time or time−group interaction effects were found for *commitment*.

Discussion

This study set out to investigate the importance of clients' motivational language for treatment outcome in g-MCT for GAD. We examined the associations between MISC in sessions 1, 4, and 7 and worry scores at post-treatment and follow-up. We also explored the differences in motivational language across sessions between treatment responders and non-responders. MISC scores in session 1 were not associated with treatment outcome. However, CT and ST in sessions 4 and 7 were significant predictors of lower and higher worry scores at post-treatment, respectively. Moreover, results revealed differential development of motivational language across sessions between treatment responders and non-responders. Responders generally articulated more CT and less ST across sessions. This tendency was especially evident for utterances regarding *taking steps*.

The lack of association between motivational language in session 1 and treatment outcome is congruent with a related study of MCT versus CBT for GAD (Joramo et al., 2021). A potential explanation for the non-significant results in session 1 could be the relatively few motivational statements uttered in this session. Positive *reason* was the most frequent statements, reflecting therapists addressing negative metacognitions about worry. The non-significant session 1 findings diverge from MISC-studies of other treatment modalities (e.g., CBT and MI; Lombardi et al., 2014; Poulin et al., 2019). Hence, a plausible explanation for the non-significant findings might be the strictly structured nature of the first session of MCT. The majority of the first session is devoted to creating a case formulation. Furthermore, non-significant session 1 findings might reflect group conformity for the session in question. Alternatively, individual differences in assertiveness and verbosity might have affected the number of utterances being expressed by the different group members in the first session. Perhaps motivational utterances in session 1 were somewhat affected by conformity, social desirability bias, and a need to maintain group cohesion. If so, one might question the validity of such motivational utterances.

In line with this reasoning, the results indicate that motivational language becomes more important during subsequential, less structured sessions of MCT. A less structured format might facilitate client-utterances regarding treatment progress, and such pronouncements might be more valid indicators motivation. In support of this, Joramo et al. (2021) found CT and ST during session 4 to be more predictive of better and worse treatment outcome, respectively, than CT and ST in session 1. This line of reasoning gained further support by this study. The results established CT and ST in sessions 4 and 7 as valid prognosticators of less and more worry at post-treatment, respectively.

Other research works on the predictive capacity of CT on treatment outcome have investigated session 1 (Ewbank et al., 2020; Lombardi et al., 2014; Poulin et al., 2019). Findings have been somewhat inconsistent. The study encoded CT across multiple sessions and discovered that the predictive capacity of such utterances increased as therapy progressed. This finding is further substantiated by Goodwin et al. (2019) findings, which established the proximal effect of CT on worry reduction.

The results also demonstrated that ST in sessions 4 and 7 predicted higher worry scores at post-treatment. This finding is congruent with other studies, which have established ST as a robust predictor of treatment outcome (e.g., Lombardi et al., 2014; Poulin et al., 2019). An important element of the CT and ST findings seems to be related to the utterances regarding *taking steps*. In later sessions, the therapists often gave the patients much time to report their progress or lack thereof. This led to many *taking steps* utterances relative to the other categories. We found the strength of *taking steps* to be an important predictive factor for worry scores at both post-treatment and follow-up, as positive *taking steps* were indicative of less worry. Similarly, Joramo et al. (2021) found this variable to be a strong predictor of worry scores. Hence, *taking steps* might reflect symptom improvement or treatment adherence. This finding is consistent with Marker et al. (2019) who found that an increase in ST (i.e., reduction of *taking steps*) during exposure sessions was associated with poorer outcome. Taken together, these findings highlight the importance of *taking steps* in accordance with the goals of therapy, to achieve a successful therapy outcome. We suggest that future research should explore the relationship between *taking steps*, treatment adherence, and changes in self-efficacy.

There are some concerns that *taking steps* might reflect treatment outcome and/or adherence and not motivation *per se*. Miller & Rollnick (1991) defined motivation as "the probability that a person will enter into, continue, and adhere to a specific

change strategy" (p. 19). *Taking steps* pertains to utterances regarding recent behavioral change made by the client which is clearly related to the target behavior (Houck et al., 2011). Hinged on these premises, *taking steps* seems to fall within the original definition of motivation (Miller & Rollnick, 1991), as continuing and adhering to a specific change strategy is considered as motivation. Furthermore, *post hoc* regressions removing *taking steps*-scores from the total ST scores, revealed that ST was still a significant predictor of post-treatment worry scores, although CT was not. This indicates that the significant ST findings is not entirely dependent on *taking steps* utterances.

Limitations and Implications

This study has several limitations that warrants consideration. The number of analyses might inflate the risk of family-wise error, raising the possibility of chance findings. However, the options for fitting other models to the data were limited, as the sample size was not sufficient for fitting a three-level multilevel model (Maas & Hox, 2005). Hence, parsing patient-level and group-level motivation was not possible.

A meta-analysis investigating the ICC in group treatment found an average value of 0.06 (Kivlighan et al., 2020), suggesting that group membership accounted for 6% of the variability in members' post-treatment outcomes. In this study, the ICCs for ST were relatively low, but values for CT and PSWQ were elevated. These ICCs indicate that there were some effects of group membership on both CT and treatment outcome. Hence, there could be systematic differences in positive motivation-level and symptom-level between groups. Such differences could involve different levels of group cohesion and group climate. Hence, clinicians should be aware of these conceivable effects, and attempt to address potential influencing factors. More research is needed to find specific moderators of the ICC (Kivlighan et al., 2020). Moreover, motivation was not a significant predictor of treatment outcome when using group-mean centered scores. This suggested that group-level average motivation scores predicted treatment outcome, while individual patient-level variability around these averages was unimportant. This finding indicates that it may not be the patients' level of motivation but rather the group's overall level of motivation that has predictive value. However, this assumption requires further testing using multilevel modeling and larger sample sizes. If the results are replicated in other samples, it could have important implications for how therapists attempt to promote motivation in g-MCT for GAD.

This study cannot establish the degree to which the current findings are specific to the g-MCT treatment modality, due to the lack of a comparison group. The lack of repeated outcome assessments should also be acknowledged as a limitation. Investigation of more proximal, within-person associations between motivational utterances and GAD-symptoms (e.g., with a linear change model) would be valuable to the research field. The absence of repeated outcome assessments also restricted investigation of the temporal relationship between motivational language and worry-reduction and symptom-reduction. Symptom-reduction might precede increased motivation.

As discussed, *taking steps* might be confounded with treatment adherence. Future studies should therefore explore the relationship between these constructs. Furthermore, although coders were kept blind to treatment outcome, unmitigated blinding is impossible, due to some spontaneous in-session utterances regarding symptom-improvement or lack thereof. The study did not control for patient's overall verbosity (number of utterances), and the non-significant session 1 findings should be interpreted with caution due to the strictly structured nature of this session in MCT. Hence, the predictive validity of patients' motivational language could be impaired in the session in question.

Hinged on the discussed limitations, future studies should include randomized controlled trials with larger samples and repeated outcome assessments. This would enable investigation of the temporal relationship between motivational language and symptom-reduction, in addition to exploration of whether these findings are unique to MCT. Also, attention should be paid to the effect of group nesting, as individual-level and group-level motivation possess differential contribution to therapy outcome.

This study has implications for psychological treatment of GAD. Clinicians could monitor and address patients' motivational language throughout the treatment. The results indicate that the patterns of ST and *taking steps* are especially important determinants of treatment outcome. Further investigations of possible motivational cutoff scores could make findings more easily interpreted by clinicians. As a clinical heuristic, one might dichotomize patients into two groups, based on positive versus negative *taking steps*-scores. Patients with negative *taking steps* scores in session 4 had a post-treatment PSWQ-score of 50 (vs. 40 for the positive *taking steps* group, $p = .010$). For session 7, this difference is 56 versus 36 ($p < .001$). In other words, clinicians could be aware of patients with overall negative

taking step-scores after session 4, as this may be indicative of a poor treatment outcome. Thus, clinicians might address and resolve such motivational issues at this point in therapy.

Summary

These findings indicated that patient motivational language in sessions 4 and 7 predict treatment outcome in g-MCT for GAD. Furthermore, there are significant differences in motivational development across therapy sessions for treatment responders and non-responders. Moreover, higher CT in sessions 4 and 7 predicted less worry at post-treatment, whereas higher ST in sessions 4 and 7 predicted more worry. The results also indicate that *taking steps* could be of particular importance; however, this may be due to an overlap with treatment adherence and symptom improvement. These findings confirm the predictive validity of MISC in sessions 4 and 7 of g-MCT for GAD, and highlight the importance of the therapists being attentive to and addressing motivation.

Author contributions

ERL and SS designed the study. ERL, MT, and TLS performed the MISC-coding procedures. ERL and SS were responsible for statistical analyses. ERL and SS drafted and revised the article. SH conducted the therapy. SS was the principal researcher and obtained the ethical approval. All authors revised the manuscript and approved its submission.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

Data Availability Statement.

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Espen R. Lassen http://orcid.org/0000-0001-6655-4178
Svein Haseth http://orcid.org/0000-0003-4825-1450
Stian Solem http://orcid.org/0000-0002-6942-2645

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