THE PREDICTIVE CAPACITY OF SELF-REPORTED MOTIVATION VS. OBSERVED MOTIVATIONAL LANGUAGE IN COGNITIVE BEHAVIOURAL THERAPY FOR GENERALIZED ANXIETY DISORDER

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Abstract

Client change motivation is considered a key factor in psychotherapy. Existing research on motivation has largely relied on self-report, which is prone to response bias and inconsistently related to treatment outcome. In contrast, early observed client in-session language may be a more valid measure of initial motivation. The present study investigated 85 clients undergoing cognitive behavioural therapy alone (CBT) or CBT infused with motivational interviewing (MI-CBT) for generalized anxiety disorder. The aims were: (1) to compare the predictive capacity of motivational language vs. self-reported motivation, and (2) to examine the influence of treatment condition on motivational language. Findings revealed motivational language explained up to 38% of outcome variance, even 1-year posttreatment. In contrast, self-reported motivation failed to predict outcome. Moreover, MI-CBT was associated with a decrease in detrimental motivational language compared to CBT alone. These findings support attending to motivational language in CBT and responding to these markers using MI.

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Motivation is widely considered a key factor bearing on psychotherapy outcomes, and many studies have been conducted attempting to quantify the effects of client motivation on the therapeutic process and client outcomes, across many psychological disorders (Dozois, Westra, Collins, Fung, & Garry, 2004). Client motivation to change can fall on a continuum of low to high, or one may be ambivalent about changing; that is, desiring change but simultaneously showing reluctance, or willing to change certain behaviours but not others. Unfortunately, research on client motivation has been hampered by inadequate measurement (Dozois et al., 2004; Hunter, Button, & Westra, 2014). Current measures of motivation are mainly self-report, which can be rife with validity concerns due to response bias and ceiling effects (Westra, 2011). Moreover, although self-report motivation measures often reliably predict treatment dropout, they tend to be weak and inconsistent predictors of clients' treatment outcomes (e.g., Kampman, Keijsers, Hoogduin, & Hendriks, 2008; Pinto, Pinto, Neziroglu, & Yaryura-Tobias, 2007; Vogel, Hansen, Stiles, & Götestam, 2006). The current state of motivational research calls for observational or behavioural measures to be used to circumvent the problems associated with self-report. Recently, an observational measure of motivation, the MISC (Motivational Interviewing Skills Code; Glynn & Moyers, 2009), has been demonstrated to reliably predict outcome in the domains of substance use (Vader, Walters, Prabhu, Houck, & Field, 2010) and anxiety disorders (Westra & Norouzian, 2018). Lombardi, Button, and Westra (2014) examined this predictive ability, and found that the MISC was able to predict outcomes above and beyond self-report measures. Observational measures of motivation thus show promise in overcoming measurement issues.

In addition to motivation, resistance is widely known to be a critical therapeutic issue that must be minimized to allow for successful treatment (Westra & Norouzian, 2018). Motivation and resistance are connected, as ambivalence regarding change can result in resistance to the therapeutic process if the client is directed to change before they are ready (Button, Westra, Hara, & Aviram, 2015; Westra, 2012). This is understandably common in action-oriented therapies such as Cognitive Behavioural Therapy (CBT), where high motivation is often assumed or required.

With these issues in mind, the present study sought to directly compare self-report measures of motivation to the predictive capacity of observed motivational language as assessed by the MISC, hoping to replicate the effect demonstrated by Lombardi and colleagues (2014). A measure of interpersonal resistance was also incorporated into the MISC, hoping to further improve the ability to predict outcomes. Given the importance of motivation in directive therapies, this study examined this measure in CBT for GAD. This study also examined the effects on motivation when Motivational Interviewing (MI; Miller & Rollnick, 2013) was integrated into CBT treatment for GAD (Westra, 2012), thus attempting to demonstrate this effect in two different therapies.

A review of the current research surrounding these topics follows. First, I will outline the importance of client motivation in therapy, review the problems associated with self-report measures of motivation, and outline the existing literature using the MISC (Glynn & Moyers, 2009). Next, I will outline the problem of resistance and its association to motivation, and will indicate how these two processes effect CBT treatment. Further, I will review how integrating MI into this treatment has affected motivation and resistance. Finally, I will outline the specific aims of the present study.

Client Motivation in Psychotherapy

Client readiness or motivation to change is widely considered by therapists to be essential to therapeutic outcomes (Dozois et al., 2004; Keijsers, Hoogduin, & Schaap, 1994). In a 2010 survey by the American Psychological Association of clinician experiences in treating panic disorder, 67% of clinicians identified minimal client motivation at therapy outset as a problem. Client motivation also influences a number of factors essential to the therapeutic process, such as therapeutic alliance, homework compliance, and commitment to therapy. For example, when looking at a number of client dispositional characteristics, Bachelor, Laverdière, Gamache, and Bordeleau (2007) found that only motivation was significantly related to client collaboration.

In the addictions domain, motivation measured via self-report has been reasonably successful in predicting outcomes. For example, Meier, Donmall, Barrowclough, McElduff, and Heller (2005) reported improved alliance with drug users motivated to seek help, but poor relationships with clients who were in therapy because of external pressures. Similarly, in individuals receiving treatment for alcohol abuse, low internalized motivation predicted dropout (Ryan, Plant, & O'Malley, 1995). More recently, Collins, Malone, and Larimer (2012) assessed predictive ability of motivation in relation to drinking outcomes using the SOCRATES (Stages of Change Readiness and Treatment Eagerness Scale), a self-report measure of motivation (Miller & Tonigan, 1996). They discovered that motivation to change predicted decreased alcohol consumption on drinking occasions, greater odds of not drinking to intoxication, and reduced alcohol related problems. Over the two-year follow-up period, motivation to change was even more predictive of behaviour change than was treatment attendance (Collins et al., 2012). Despite the relative success of self-report measures in addictions, the findings linking motivation and outcomes are less compelling in other domains such as eating disorders and anxiety disorders (Geller & Drab, 1999; Kampman et al., 2008; Westra, 2012).

In general, measures of motivation can be problematic and limited for many reasons. Motivation is a multidimensional and complex construct. Individuals may be willing to change some aspects but not others (e.g., willing to reduce bingeing, but not food restriction, among individuals with bulimia nervosa), or may feel both ready and resistant to change (Geller, Cockell, & Drab, 2001). Most measures of motivation that have been developed are self-report measures, and given the complexity of change, articulating desire for change in response to simple questionnaire items may be an oversimplification. Furthermore, individuals have the tendency to respond pro-recovery to questionnaire measures in psychotherapy, as a function of social desirability bias (Geller, Brown, Zaitsoff, Menna, Bates, & Dunn, 2008). Therefore it is not surprising that a consistently successful measure of motivation has not been developed, and that existing measures tend to be poor predictors of outcome (Miller & Johnson, 2008; Westra, 2011). One of the most commonly used measures of motivation is the University of Rhode Island Change Assessment questionnaire (URICA), but the even the predictive ability of the URICA is often lacking (Field, Adinoff, Harris, Ball, & Carroll, 2009). The URICA has been demonstrated to successfully differentiate treatment completers from non-completers (Vogel et al., 2006), and in some cases can differentiate treatment responders from non-responders (Dozois et al., 2004), but is often associated with outcome in unexpected and unreliable ways (Field et al., 2009). For example, in a study applying the stages of change to individuals with GAD in a pharmacological trial, high contemplation was associated with a greater decrease in anxiety and illness severity. However, there was no relation between action and outcomes (Wilson, Bell-Dolan, & Beitman, 1997). It is counterintuitive that a measure of contemplation (which describes being stuck and ambivalent about change) is associated with improved outcome, yet a measure of taking action to change is not related to outcome.

High ambivalence or low motivation to change is a particularly common problem in eating disorders, and therefore research in this area is robust. Research in eating disorders has also demonstrated that questionnaire measures of motivation to change do not consistently predict psychotherapy outcome (Geller et al., 2008). Geller and Drab (1999) note that these motivational measures were initially developed for single symptom problems such as drug and alcohol use, and therefore might not fully capture motivation in multidimensional disorders encompassing a range of behavioural, cognitive, and affective features. Thus, while these measures are effective in substance use disorders, their predictive capacity is weaker in eating and anxiety disorders. In response to this issue, Geller and Drab (1999) created a semi-structured interview, the Readiness and Motivation Interview (RMI) to better understand a client's motivation in eating disorders. To limit self-presentation bias, the therapist emphasizes the collaborative nature of the assessment and maintains a curious, non-judgemental stance. As a result, the RMI is a better predictor of behaviour change than commonly used self-report questionnaires (Geller & Drab, 1999).

In 2008, Miller and Johnson attempted to create a better self-report measure of motivation by examining the language clients use when discussing change in therapy sessions. They discovered six themes of language about change: desire, ability, reasons, need, commitment, and taking steps. Using these themes, they created the Change Questionnaire (CQ), to hopefully improve validity and predictive capacity of self-report motivational measures. Each language theme has two items in the CQ, and clients rate how much they agree with these items on a scale from 0-10 (ex. *"There are good reasons for me to make this change"*; *"I am trying to make this change"*; Miller & Johnson, 2008). When tested across seven addiction treatment sites (*N*=1035 participants), the measure had a very large ceiling effect, with most subjects reporting

10/10 agreement on every item. Thus, although it uses client's own language regarding change, this measure could have been subject to impression management or overconfidence. This is especially likely since this survey was administered to individuals who were already in treatment, and, thus, these individuals may have wanted to convey high motivation to change.

Following studies showed that this measure does have promise in regard to predictive capacity. Gaume, Bertholet, Daeppen, and Gmel (2013) used the CQ as a predictor for hazardous alcohol and tobacco use at 6-month follow-up in 308 young adult males. Higher change scores predicted decreased hazardous tobacco and alcohol use, showing support for the predictive validity of the CQ in tobacco and alcohol use (Gaume et al., 2013).

Further, Westra (2011) used the CQ to measure motivation to change in individuals undergoing CBT for generalized anxiety disorder (GAD). Higher levels of motivation according to the CQ were associated with higher levels of homework compliance, and better worry reduction at post-treatment and 1-year follow-up. Although the capacity for ceiling effects were noted, there was sufficient variability in CQ scores in this study to predict therapy outcomes. Importantly, two other measures were used to measure motivation in this study; the Client Motivation for Therapy Scale (CMOTS, a self-report measure; Pelletier, Tuson, & Haddad, 1997) and an observational measure of client resistance (CRC; Chamberlain et al., 1985). Although the CQ predicted outcomes, the observational measure accounted for much more of the variance in outcomes, and the CMOTS was unrelated to outcome. It was concluded that motivation to change can be captured to some degree on self-report measures, but that highly face valid measures such as the CQ may fare better than indirect self-report measures of motivation. Similarly, Lombardi and colleagues (2014) used the CQ along with CMOTS and the MISC in individuals undergoing CBT for GAD, and discovered that only the CQ and the MISC

were predictive of outcomes at the end of treatment. However, the MISC accounted for an additional 17% of the variance in treatment outcome, above and beyond the CQ (Lombardi et al., 2014)

Thus, the CQ shows some promise in predicting outcomes in addictions and anxiety disorders, and should be explored further in relation to other measures of self-report and observational measures in order to elucidate its predictive ability.

When one considers the context in which these self-report measures of motivation are completed, it is unsurprising that they are often unrelated to outcome, as response bias would be highly likely. When presenting for therapy, one would naturally feel compelled to indicate that they are ready and willing to change, so as to put themselves in a favourable light to their new therapist and to hopefully get the most out of therapy (Lombardi et al., 2014). Furthermore, a new client might assume that if they reported they were not ready or willing to change, that the therapist would be potentially less positive and/or interested in working with them. Finally, one may truly believe they are ready to change when they sign up for therapy, as it is usually compelled by high levels of distress, but may not realize they are unwilling to give up certain aspects of their thoughts or behaviour until the therapist makes a suggestion for change (Waller, 2012; Westra, 2011). A measure of motivation that is not self-report is necessary to mitigate these concerns. Observational measures of motivation are a promising solution to these problems.

Motivational Language as a Measure of Motivation

The Motivational Interviewing Skills Code (MISC; Glynn & Moyers, 2009) is an observational system that allows for the coding of client language regarding change during a session of psychotherapy, and it has been used in a variety of contexts to measure motivation in

psychotherapy clients (Glynn & Moyers, 2009). Two types of statements are coded: statements in favour of change (change talk, or CT), and statements in favour of the status quo/in opposition to change (counter-change talk, or CCT). Subtypes of CT and CCT are desire, ability, reasons, need, and commitment. Later, 'taking steps' was also included as a subtype, making these subtypes identical to those identified by Miller & Johnson (2008) and used in the CQ, discussed above (Amrhein, Miller, Yahne, Palmer, & Fulcher, 2003). Thus, any statement reflecting the desire to change, ability to change, reasons to change, need to change, commitment to change, or taking steps towards change are considered change talk statements, and statements reflecting the opposite are considered counter-change statements. The more CT statements, the more motivated a client is purported to be, and the more CCT statements, the less motivated. High levels of both CT and CCT reflects ambivalence. Motivational statements are measured by independent coders, so as to prevent bias on behalf of the therapist. Evidence indicates that therapists are poor at judging their own clients' levels of motivation, as they are too enmeshed in the process and are invested in the rating (Geller, 2002).

Some researchers caution against using client statements to determine motivation (e.g. Waller, 2012). As mentioned above, clients may believe they are motivated to change, and state they desire change, but this may not be an indicator of their actual motivation. Waller (2012) reviews the evidence surrounding clients' statements regarding motivation in eating disorders, and concludes that the most effective measure of motivation in this domain is early behaviour change. This is captured in the MISC through the many types of statements that are coded regarding change. Specifically, statements regarding ability, commitment, and taking steps to change are able to measure change already in action, and strengthens the MISC as a measure examining more than change desire or intention. For example, for an individual in therapy for

GAD, the following statement would indicate positive motivation: *"Yesterday I gave myself a list of five things I would like to accomplish, and I accomplished three of them and I felt really good, because I did my job. That really worked".* This individual took steps to reduce their worry, and was able to feel less anxious for doing so. Through client statements regarding motivation, the MISC can measure more than direct or literal statements in favour or against change.

At present, evidence for the MISC's predictive validity largely centres on the domain of drug and alcohol abuse. For example, Magill, Apodaca, Barnett, and Monti (2010) discovered that although self-reported motivation did not predict completion of a change plan in problematic drinkers, change plan completers expressed significantly more CT, and non-completers expressed more CCT. In addition, those who completed a change plan had an increasing number of arguments for change over the course of the session. Amrhein and colleagues (2003) identified that increased strength of commitment language (i.e. change talk) is associated with more favourable outcomes for drug use clients. Furthermore, many researchers have found that more change talk in therapy for drug users predicts reduced substance use**.** Conversely, more counter-change talk in therapy for these individuals predicts less reduction in substance use (e.g., Magill et al., 2014; Moyers, Martin, Houck, Christopher, & Tonigan, 2009; Vader et al., 2010).

More recently, the MISC has been applied to CBT treatment for GAD, with early CCT repeatedly emerging as a significant predictor of process and outcome variables. Higher CCT in session 1 of therapy is associated with less homework compliance, greater risk of alliance rupture, and poorer treatment outcomes (Button, Westra, & Hara, 2014; Goodwin, Constantino, Westra, Button, & Antony, 2015; Hunter et al., 2014; Lombardi et al., 2014). For example, Hunter and colleagues (2014) identified that client-therapist dyads that went on to experience an

alliance rupture in therapy had significantly higher levels of CCT at the outset of treatment than those who did not experience an alliance rupture, this being a large effect. In relation to post-treatment outcome, in 37 individuals undergoing CBT for GAD, Lombardi and colleagues (2014) identified CCT to account for 21% of the variance in post-treatment worry scores, above and beyond self-report measures of motivation.

Although in the substance use literature both change talk and counter-change talk predict therapy outcomes, in the anxiety disorder literature, counter-change talk seems to be the important predictive factor. Change talk has been repeatedly found to be unrelated to outcomes (Button et al., 2014; Hunter et al., 2014; Westra & Norouzian, 2018), with the exception of one recent study (Goodwin, Constantino, Westra, Button, & Antony, 2017). In the context of severe generalized anxiety disorder, CT was found to significantly predict mid-treatment worry, in that more change talk was related to greater worry reduction (Goodwin et al., 2017). Clearly further research is warranted. In sum, the MISC appears promising as an alternative measure of motivation in the area of CBT for anxiety, as it is predictive of outcomes and not hampered by the issues of self report. However, the MISC should be examined further in relation to other motivational measures, in larger sample sizes, and across different treatments.

Resistance in the Therapeutic Relationship

Along with motivation, resistance (or client opposition to the therapist/therapy) is a crucial factor that should be considered in therapy. Resistance is defined as any behaviour that opposes, diverts, blocks, or impedes the direction set by the therapist. Resistance can be present in both process (ex. being disengaged with the therapist) and content (ex. outwardly objecting to a therapist direction). There is strong and consistent evidence that effective psychotherapy is associated with the relative absence of resistance (Aviram & Westra 2011; Jungbluth & Shirk,

2009; Mamedova, Westra, Constantino, & Antony, 2016; Westra, 2011; Westra & Norouzian, 2018).

Early resistance in CBT is associated with poor subsequent engagement, such as homework noncompliance, early therapy termination, and poorer outcomes (Aviram & Westra, 2011; Constantino, Westra, Antony, & Coyne, 2017; Jungbluth & Shirk, 2009; Westra, 2011). Resistance has also been found to be demoralizing to both therapists and clients, and the impact on client's expectations accounts for much of the negative impact of resistance on outcomes (Mamedova et al., 2016). Resistance even as early as session 1 of therapy is capable of strongly predicting poor client outcome up to 1-year posttreatment (Aviram & Westra, 2011).

Ambivalence and resistance are not only both important to the therapeutic process, but they are interrelated, with one affecting the other. Brehm and Brehm (2013) theorize that the aversive state of reactance arises when people perceive a threat to their personal freedoms. When people are directed to change when they are not ready (i.e. when they have low motivation), they respond oppositionally by resisting the therapist direction (Westra & Aviram, 2013). In other words, high ambivalence about change may devolve into resistance if it is poorly addressed or managed (Button et al., 2015). Continuing to direct a person in this oppositional state only furthers the resistance, and this may develop into critical or hostile resistance on the part of the client (Westra & Norouzian, 2018).

Accordingly, Sijercic, Button, Westra, and Hara (2016) adapted the MISC to incorporate interpersonal context of CCT, i.e. whether or not the arguments against change were stated in the context of resistance. According to theories of motivation in the context of psychotherapy, there are two reasons to argue against change: (1) to disclose your concerns about change when you are ambivalent (i.e., ambivalent CCT, or CCT-A), and/or (2) to oppose the direction, advice, or

suggestions of the therapist (i.e., resistant CCT, or CCT-R; Miller & Rollnick, 2013). CCT-A is hypothesized to be a normal aspect of the change process, as it is a mere disclosure of conflict regarding change. For example, the therapist might indicate empathic understanding by saying, *"When negative events happen in your life, this gives you a reason to worry".* The client replies with, *"This is exactly why I am worrying. If I'm not going to worry, then who is? I have to worry".* Here the client is arguing against change, as she is explaining that her worry is important and expresses an inability to change. Although this is CCT, the client is going along with the therapist by agreeing with and expanding on the therapist's statement. The client and therapist are collaborating and are in harmony, even though the client is expressing reservations about changing, thus making it a CCT-A statement.

CCT-R (or CCT in the context of resistance) on the other hand is considered problematic, as it represents interpersonal challenge or disruption in the therapeutic relationship and treatment process. For example, the therapist might suggest, *"We can do relaxation exercises to treat the physical symptoms of anxiety".* The client replies with*, "I have never found that to work… it takes a lot of effort, and I don't seem to get the benefit"*. Here the therapist is proposing a solution and the client rejects it. The client is directly opposing the therapist as well as arguing against change, because she doesn't wish to take the steps to become less anxious. Thus, this is a CCT-R statement.

In support of this hypothesis, when differentiating CCT into ambivalent and resistant, Sijercic and colleagues (2016) discovered that CCT-R, but not CCT-A, was detrimental to outcomes. The authors reasoned that statements arguing against change in therapy are not a problem in themselves—rather, they become problematic when these statements are uttered in order to oppose the therapist/therapy (Sijercic et al., 2016). Thus, in any study examining the

predictive capacity of motivational language it seems vital to consider the interpersonal context in which statements against change (CCT) are uttered. This is important since some types of CCT (Ambivalent CCT or CCT-A) are not associated with outcomes, while other types (Resistant CCT or CCT-R) are predictive.

The Integration of MI and CBT

Motivational interviewing (MI) is a therapeutic method that specifically focuses on dealing with ambivalence about change, minimizing resistance, and increasing momentum for change (Miller & Rollnick, 2013; Westra, 2012; Westra & Norouzian, 2018). Importantly, ambivalence is seen as a normal part of the change process and reasons against change aren't opposed or suppressed by the therapist (Westra & Aviram, 2013). In turn, rather than being directed to change, the MI client often comes to voice arguments for change themselves. MI clients therefore identify their motivation as intrinsic, rather than attributing their reasons for change to the therapist, and research has indicated intrinsically motivated changes are more likely to endure (Davison, Tsujimoto, & Glaros, 1973). In addition, the collaborative and autonomy supporting "spirit" of MI is thought to help clients recognize themselves as an authority. Thus, MI addresses the problems that can hinder progress in CBT for some, specifically resistance and low motivation/ambivalence (Westra & Norouzian, 2018).

MI aims to complement existing treatments, rather than replacing them. Consequently, the success of CBT can be maintained, while also adding the benefit of reduced ambivalence and resistance, leading to improved treatment outcomes (Westra & Norouzian, 2018). When MI is integrated into CBT treatment (MI-CBT), improvements in many therapy processes and outcomes have been found. Specifically, in two randomized control trials (RCTs) comparing MI-CBT with CBT alone, MI-CBT showed a consistent advantage, particularly in terms of long-

term outcomes (Westra, Arkowitz, & Dozois, 2009; Westra, Constantino, & Antony, 2016). Clients in MI-CBT had less mid-treatment resistance, perceived greater therapist empathy, were more likely to finish the entire course of therapy, and were over five times more likely to no longer meet diagnostic criteria at one-year follow-up (Westra et al., 2016). Most notably, in terms of process, clients receiving MI-CBT have been found to have less resistance during treatment compared to CBT alone, and this goes on to mediate the comparative treatment effects (Aviram & Westra, 2011; Constantino et al., 2017). That is, integrating MI with CBT results in a more harmonious, engaging, productive therapy environment (Westra & Norouzian, 2018).

In addition to these impacts on process, many studies in the addictions domain have shown a positive effect of MI on motivational language in particular, with more CT and less CCT relative to comparison treatments (Catley et al., 2006; Miller, Benefield, & Tonigan,1993). Furthermore, within session, therapist MI-like statements have been found to be followed by CT, while MI-inconsistent statements are associated with CCT (Moyers et al., 2007). To further elucidate this association, Moyers and colleagues (2009) investigated the causal chain of improved outcomes in individuals receiving MI for alcohol abuse. These researchers discovered that even within session, MI consistent behaviours on behalf of the therapist increased the likelihood of immediately following change talk. On the other hand, MI inconsistent behaviours led to a decreased likelihood of CT. In turn, increased CT led to improved outcome. Interestingly, CCT statements in this study followed both MI consistent and inconsistent therapist behaviours. The authors concluded that therapists should not suppress client statements against change, as they are a normal part of the change process, and they often occur simultaneously with CT as the client weighs the pros and cons of changing. This supports the above theory that talk against change isn't negative *per se*, but it is possible that the context of

the talk against change is of importance. Moreover, similar studies examining motivational language in other populations are needed.

Present Study

This review of the literature has highlighted the importance of finding a reliable measure that can be used to assess motivation to change at the outset of therapy. Such a measure may allow therapists to identify individuals who might have difficulty responding to treatment, and therefore therapists could focus efforts on maximizing the gains of these individuals. Moreover, only one study has systematically compared self-report and observational measures of client motivation, and this should be replicated in a larger sample. No study in the area of anxiety has examined the impact of MI-CBT vs CBT alone on early client motivational language. Such a study is necessary in order to examine whether the benefits of integrating MI can be observed at the level of in-session language; an important mechanism in MI theory.

Drawing on the aforementioned RCT comparing CBT with MI-CBT in individuals with severe GAD (Westra et al., 2016), the first aim was to extend research on the MISC for anxiety by directly comparing its predictive capacity in session 1 to two commonly used self-report measures of motivation (described below). This study will contribute to and extend the results of Lombardi and colleagues (2014) by assessing the MISC in a larger sample. Furthermore, considering the importance of resistance in psychotherapy, this study will examine whether a measure of resistance integrated into the MISC improves the predictive capacity of this measure, and will also identify whether only specific statements against change negatively impact outcome. Finally, this study will also examine whether the predictive capacity of this measure is maintained to one-year follow-up. It was expected that observed client motivational language would be a more potent predictor of both post-treatment and one-year follow-up outcomes,

compared to client self-reported motivation. Given previous research (Sijercic et al., 2016), it was also expected that CCT-R in particular would be the strongest predictor of outcomes within language indices of motivation.

The second aim of this study was to examine the impact on client motivational language when MI is integrated with CBT (i.e., MI-CBT) compared to CBT alone. Given that early observed motivational language has been reliably found to predict outcomes in CBT, it would be important to determine if integrating MI into CBT influences client language for and against change early in treatment. Given MI's explicit emphasis on the identification of, and response to client motivational language, MI-CBT was expected to have a beneficial impact on the motivational language profile, leading to more CT and lower levels of the problematic type of counter-change talk, CCT-R.

Method

Participants

Data were obtained from an RCT examining the effects of integrating MI with CBT for severe GAD (Westra et al., 2016). Clients were 85 adults seeking treatment at one of two sites (York University, Ryerson University) in Toronto, Canada. Clients were randomly assigned to receive either MI-CBT (n = 42) or CBT (n = 43). All participants met *DSM-IV-TR* and *DSM-5* criteria for principal GAD (American Psychiatric Association, 2000; American Psychiatric Association, 2013), and were required to have high worry severity, scoring 68 or above on the Penn State Worry Questionnaire (Meyer, Miller, Metzger, & Borkovec, 1990). Unmedicated participants were required to remain unmedicated for the duration of the trial. Participants taking antidepressants were required to remain on a stable dose throughout the trial, and those who had recently discontinued antidepressant use were required to undergo a washout period of 3 months.

Participants were not in concurrent psychotherapy or taking benzodiazepines. Individuals meeting criteria for a concurrent psychotic or bipolar disorder, substance dependence, cognitive impairment, or severe suicidal ideation were excluded from the trial. See Table 1 for characteristics of the included participants. Of the 85 participants in this study, 69 remained at post-treatment, and 67 presented for 1-year post-treatment testing.

Treatments

Clients in both conditions underwent 15 weekly individual therapy sessions, as well as two booster sessions at 1 and 3 months following treatment. Those in the CBT condition received CBT for all sessions. The CBT was adapted from several evidence-based protocols (see Westra et al., 2016 for details) and included psychoeducation, self-monitoring, progressive muscle relaxation, cognitive restructuring, and behavioural interventions. MI-CBT clients received four sessions of MI at the beginning of treatment, which involved exploring their feelings about change and preparing to change, but did not include any change-oriented strategies. For the remaining sessions, MI-CBT clients received CBT integrated with MI, which included change-oriented methods while maintaining the MI 'spirit' of empathy, collaboration, and autonomy support, and switching to an MI style in the presence of markers of ambivalence or resistance.

To control for allegiance, therapists delivered either CBT or MI-CBT (not both), self-selected into the condition they wished to deliver, and were supervised independently by an expert in the respective treatment approach. All therapists were either doctoral candidates in clinical psychology or postdoctoral psychologists, and all were female. There were 21 therapists. MI-CBT therapists saw a range of 1-13 clients, and CBT therapists saw a range of 1-6 clients, both groups with a Median of 4. Therapist age and clinical experience did not differ between

treatment group (Age M = 28.76, SD = 3.46 years; Experience M = 294.74, SD = 420.44 hours). Therapists had extensive training through workshops and pilot cases prior to seeing the trial clients, were required to demonstrate competence in at least one practice case, and were supervised with weekly video review.

Measures

Penn State Worry Questionnaire (PSWQ; see Appendix A)

The PSWQ (Meyer et al., 1990) is a widely used 16-item instrument assessing trait worry, and served as the principal outcome measure in the trial and the present study. Scores range from 16-80, with higher scores representing higher worry severity. The PSWQ has high internal consistency and temporal stability, and good convergent and discriminant validity (Brown, Antony, & Barlow, 1992). The PSWQ reliably differentiates GAD from other anxiety disorders and healthy controls (Brown et al., 1992). For the current study, α was .62 at baseline, but ranged from .96 to .97 at posttreatment and follow-up assessments.[1]

Change Questionnaire (CQ; see Appendix B)

The CQ (Miller & Johnson, 2008) is a measure of self-reported motivation. It is a 12-item scale derived from psycholinguistic research on the natural language clients use to describe their own motivation. There are two items each representing desire, ability, reasons, need, commitment, and taking steps to change. Clients identify what they are considering changing (in

[1]The restriction of range on the PSWQ at baseline likely negatively influenced reliability, given high severity on the PSWQ as a criterion for inclusion. With more variability at posttreatment and follow-up assessments, the internal consistency of the measure was back to its typically high levels.

this case “to worry less”), and complete all items on a scale from 0-10 according to the degree that each statement describes their motivation to change the identified issue. Scores range from 0-120, with higher scores representing higher motivation to change. The scale has good internal consistency and test-retest reliability (Miller & Johnson, 2008). For the current study, α was .75 for the CQ at baseline.

Client Motivation for Therapy Scale (CMOTS; see Appendix C)

The CMOTS (Pelletier et al., 1997) served as a second self-report measure of motivation. It is a 24-item measure of client motivation based on self-determination theory (Deci & Ryan, 1985). It theorizes that there are six types of motivation falling on a continuum of autonomy, from amotivation to intrinsic motivation. This measure yields subscale scores for each type of motivation, as well as a total score which is calculated as the sum of intrinsic, introjected, identified, and integrated motivation minus the sum of the external motivation and amotivation. Higher total scores reflect higher levels of motivation. The CMOTS has good internal consistency, and good convergent and discriminant validity (Pelletier et al., 1997). For the current study, α was .84 for the CMOTS total score at baseline.

Motivational Interviewing Skill Code (MISC) Version 1.1

The MISC Version 1.1 (Glynn & Moyers, 2009) was used to quantify client motivational language or statements about change in session 1. The client/therapist interaction is video recorded and then coded by independent coders at a later date. Client verbalizations are categorized as movement toward or away from an identified target behaviour. CT is language in which a client endorses or expresses agreement with change, argues for change, or moves toward change. CCT is language that reflects arguments against change, objection to change, or

movement away from change. In the substance abuse domain, the MISC has been found to have good reliability and strong predictive validity (e.g., Magill et al., 2010; Moyers et al., 2009; Vader et al., 2010). Additionally, the MISC has recently been applied to the area of GAD, also demonstrating reliability and predictive validity (Button, 2013; Lombardi et al., 2014; Sijercic et al., 2016).

Adapted Client Resistance Code

Resistance was coded using an adapted version (Westra, Aviram, Kertes, Ahmed, & Connors, 2009) of the Client Resistance Code (CRC; Chamberlain, Patterson, Reid, Kavanaugh, & Forgatch, 1984). Resistance is defined as any behaviour that opposes, blocks, diverts, or impedes the direction set by the therapist. It can be expressed directly, for example through verbal statements opposing the therapist, or indirectly through the therapeutic process, with behaviours such as disagreeing, ignoring, or interrupting. The original CRC has 11 resistance categories, but these categories have been collapsed into one general resistance rating in the adapted resistance code. This captures the presence or absence of resistance and aids in achieving reliability among coders. The client/therapist interaction is video recorded and then coded by independent coders at a later date. Resistance is rated on a scale from zero to three: 0 = no resistance, or cooperation; 1 = minimal or qualified resistance; 2 = clear, unqualified resistance; 3 = hostile resistance or confrontation. The original CRC has good construct and predictive validity, good face and content validity, and excellent reliability (Bischoff & Tracey, 1995; Chamberlain et al., 1984; Patterson & Forgatch, 1985). The adapted CRC has been found to possess strong predictive validity in many studies (e.g., Aviram & Westra, 2011; Aviram, Westra, Constantino, & Antony, 2016; Sijercic et al., 2016) and is a strong predictor of CBT therapist nonadherence (Zickgraf et al., 2015).

Procedure

Participants were recruited through community advertisements in the greater Toronto area. Informed consent was obtained for all participants, which included consent to videotaped sessions and secondary data analyses. The CQ and CMOTS were completed by participants at baseline, prior to session 1 of treatment. PSWQ scores collected at pretreatment, posttreatment, and 1-year follow-up were used.

MISC Coding

The first session of treatment for each participant was coded by independent coders in its entirety in order to quantify the frequency of CT and CCT statements. As GAD is a heterogeneous disorder with various therapeutic targets for change, a broad range of targets were identified throughout the session (e.g., worry, reassurance seeking, perfectionism, etc.) and language was coded as moving toward or away from any of these targets. Verbalizations coded included any statements that expressed ability, commitment, desire, need, or reason (or lack thereof), or step toward (or away from) change (Glynn & Moyers, 2009). Frequency of CT and CCT statements were determined by tallying the amount of each type of statement and dividing this value by the total number of client utterances in the session. This was done to control for individual differences in client verbosity.

The team of coders consisted of two upper level undergraduate students in psychology and a master's level graduate student in clinical psychology. One of the coders was involved in adapting the MISC for use with CBT for GAD, and the remaining two coders were trained to criterion over a period of 4 months. Coders participated in two 3-hour training workshops and independently rated test materials to determine proficiency, until 85 percent observed agreement against the test materials was achieved. Coders were kept blind to clients' outcome and met

weekly to discuss any coding concerns. Twenty-five percent of all materials were double coded to determine reliability. Kappa coefficients for each pair of coders and ranged from 0.75 to 0.95, with a mean of 0.86, indicating good to excellent agreement (Fleiss, 1981).

Resistance Coding and Differentiation of CCT

To determine CCT-A and CCT-R, the first session was also coded for resistance. Following this, each specific CCT statement (previously coded using the MISC) was examined to determine whether it overlapped with resistance (i.e., was uttered in order to oppose the therapist). CCT statements that were also coded as resistance were coded as CCT-R, and CCT statements that occurred during cooperation were coded CCT-A. Tallies of ambivalent and resistant CCT were divided by the number of utterances in the session to control for client verbosity.

Resistance was coded by three graduate students in clinical psychology and one doctoral level psychologist. All coders participated in a 2-day workshop on the adapted CRC, and independently coded practice sessions with weekly review meetings over a 10-month period until 85% observer agreement on the practice codes was achieved. Coders were blind to client treatment condition and outcome. Interrater reliability was calculated for 20% of the session content, with weighted kappa coefficients ranging from .70 to .98, indicating good to excellent agreement (Fleiss, 1981).

Data Analyses

Preliminary analyses were conducted to examine differences between treatment groups on demographics and initial severity. T-tests were conducted for continuous variables, and chi square analyses for categorical variables. If a significant difference between treatment groups

existed by chance, these variables were controlled for in subsequent between-groups analyses. Correlations between all study variables were calculated.

Multilevel modelling was conducted using the R Statistical Environment to determine the relation between the motivational measures and outcomes. Specifically, random intercept models were estimated to account for the nesting of clients within therapists, controlling for potential therapist effects. In step 1 of the model, baseline PSWQ score was regressed onto outcome to control for baseline worry. In step 2, self-report measures of motivation were included to determine how they added to the predictive capacity of the model. In step 3, motivational language measures were added to the model to determine their predictive capacity, over and above self-report measures. The change in R^2 was calculated from step 2 to step 3 and tested for significance. This process was completed twice, once for each outcome measure (posttreatment and 1-year posttreatment PSWQ). The residuals of each final model were graphed, and levels of skew and kurtosis were examined.

Missing data were accounted for using complete case analysis. Final post-treatment analyses had N=69, and final 1-year posttreatment analysis had N=67. Differences between completers and non-completers in demographics, initial severity, and motivation variables were assessed using t-tests for continuous variables, and chi square analyses for categorical variables. These groups differed only in proportion of utterances that were change talk, with 19% of utterances being CT for completers, and 12% of utterances being CT for non-completers (p = .042).

To examine motivational language differences between treatment groups multilevel modelling was again used, with random intercept models accounting for nested data. Treatment group was regressed onto each motivational language measure (CT, CCT-A, and CCT-R), while

controlling for gender and medication status. These analyses did not contain any missing data, so for all analyses N=85.

Power analysis from the parent RCT study indicated that a total sample of 89 participants was needed to have .80 power to detect moderate treatment effects on linear change rates (Westra et al., 2016). The study was close to the power estimate, and power is presented for each analysis via the β values in Table 3 and Table 4.

The trial and subsequent secondary data analyses were approved by the institutional review boards at the two data collections sites. Thus, the present study conforms to the standards of the Canadian Tri-Council Research Ethics Guidelines.

Results

Descriptive Statistics

Client demographics and the means and standard deviations for all measures are presented in Table 1. Despite random assignment in the larger parent study, the CBT alone group had slightly more female participants (p = .049), as well as a tendency toward having more medicated participants, though this finding was not statistically significant (p = .062).

Participants in the CBT alone group scored higher on the CQ (p = .013), indicating increased motivation, but did not score higher on the other motivational measure, the CMOTS, showing inconsistency in motivational self-report measures at baseline. Initial severity, age, highest level of education, ethnicity, marital status, worry chronicity, and comorbidity did not differ significantly between treatment groups.

Intercorrelations of Measures

Correlations between the various measures evaluated in the present study are presented in

Table 2. The CQ and CMOTS were significantly positively correlated, but neither were significantly correlated with the observed measures of motivational language (CT, CCT-A, CCT-R). Correlations among the observed language measures indicated that CT was significantly positively correlated with CCT-A.

CQ was significantly negatively correlated with PSWQ at posttreatment, but not at 1-year follow-up. In contrast, higher scores on both types of observed counter-change statements (CCT-A and CCT-R) were significantly correlated with higher posttreatment and 1-year posttreatment worry. Neither CT nor CMOTS were significantly correlated with worry outcome.

Predicting Outcomes with Motivational Measures

The results of the models are presented in Table 3. The intraclass correlation (ICC) for therapist effects on PSWQ score was .0016, suggesting that therapist characteristics accounted for less than 1% of the variance in PSWQ (Constantino et al., 2017; Westra et al., 2016). This indicates that variation in PSWQ score was not due to clients sharing the same therapist.

Predicting Posttreatment Worry

Neither pretreatment PSWQ nor the self-report measures of motivation (CQ and CMOTS) had a significant effect on posttreatment PSWQ. When observed language measures of motivation (CT, CCT-A, CCT-R) were added to the model, CT did not have a significant effect on posttreatment worry, but both subtypes of CCT did. For every 1% increase in CCT-A, posttreatment worry scores increased by .9 points. For every 1% increase in CCT-R, posttreatment worry increased by 2.3 points. The change in R^2 revealed the final model explained 21% more of the variance in posttreatment worry than the model including self-report measures alone ($p < 0.001$). The assumption of normality was not found to be violated in the final model.

Predicting Worry at 1-year Posttreatment

In this model, baseline PSWQ, CQ, and CMOTS scores also had no significant effect on 1-year follow-up worry scores. However, all observed motivational language indices predicted long-term outcome. For every 1% increase in CT, worry 1 year later decreased by .4 points. For every 1% increase in CCT-A and CCT-R, worry at 1-year follow-up increased by 1 and 2.8 points respectively. The final model accounted for 38% more variance when observational measures of motivation were included, compared to self-report alone ($p < .001$). The assumption of normality was not found to be violated in the final model.

Motivational Language Differences by Treatment Group

Table 4 presents the results of the between-group analyses. Neither levels of CT nor CCT-A differed significantly by treatment group. However, CCT-R levels did differ significantly as a function of treatment group. Compared to CBT alone, MI-CBT clients showed a significantly lower proportion of statements in the first session of treatment that were CCT-R. Where only half a percent of statements were CCT-R in the MI-CBT group, two percent of statements were CCT-R in the CBT alone group. The effect size for this difference was $d = .64$ (95% CI: 1.07 to 0.20), which indicates a medium effect size.

Discussion

The results of this study support the use of observational measures over self-report measures of motivation in CBT for GAD. Of the self-report and observational measures of motivation examined, only in-session observed motivational language, as measured by the MISC and by an arm's length observer, significantly predicted worry. Moreover, whereas the self-report measures of motivation were significantly correlated with each other, they were not

correlated with any of the observed motivational language indices. This implies that self-report measures are assessing a different construct from that of in-session language assessment.

Together, the motivational language indices consistently predicted both posttreatment and 1-year follow-up outcomes. In particular, higher levels of both ambivalent and resistant counter-change talk in the first session were related to greater worry at both posttreatment and at 1-year follow-up. In addition, higher levels of change talk were associated with less worry at 1-year follow up. In contrast, the two self-report measures of motivation were not significantly related to client outcome at either time point. In fact, the observed measures of motivation explained a significant amount of the variance in outcome at posttreatment, above and beyond self-report measures. The predictive capacity increased even further at 1-year follow-up. This finding is in line with previous research comparing the MISC and self-report, with Lombardi and colleagues (2014) finding the MISC to explain the same proportion of variance in worry severity at posttreatment.

Among the types of motivational language, talk against change was the most potent predictor of outcome. This finding is consistent with previous studies on CBT for GAD in which counter-change talk emerged as a consistent predictor of outcomes, whereas change talk was nonsignificant (Hunter et al., 2014; Lombardi et al., 2014; Westra & Norouzian, 2018), with the exception of one study (Goodwin et al., 2017). Recent research in addictions has also focused more on talk against change, noting that it has a greater effect on outcome compared to talk in favour of change (Apodaca et al., 2014; Magill et al., 2014). The potency of counter-change talk as a predictor is striking considering how relatively rare it is in a session. Overall, an average of only 11% of client utterances were against change in the first session. Stated differently, most client utterances did not oppose change in session 1. This suggests that not all client utterances in

a session are of equal significance, and therapists must be able to sift through these statements and pick out key moments when they occur.

In particular, resistant talk against change had the largest effect on client outcome. Although ambivalent counter-change talk did predict increased post-treatment worry scores, this effect was three times stronger with resistant counter-change talk, validating Sijercic and colleagues' (2016) conclusion that the interpersonal context of talk against change is critically important. Resistant talk against change was the rarest of all motivational language indices, yet had the most potent effect. Making up an average of only 1.2% of client utterances, this variable was capable of strongly predicting outcomes over a year later. Resistant talk against change is clearly detrimental to outcomes, and therapists should actively be on the lookout for this type of language and should aim to prevent its occurrence. A number of recent studies looking at resistance support that these moments are very important, having found resistance to be one of the main predictors of outcome, and to be much more predictive than cooperation (Westra, 2011). While therapists may be naturally inclined to look to change talk as a barometer of a client's motivation, the emerging results in the area of CBT for GAD suggest that counter-change statements, and resistant counter-change statements in particular, are actually more revealing.

The presence of ambivalent talk against change as a predictor of outcome (although to a lesser extent than resistant talk against change), was contrary to previous research from Sijercic and colleagues (2016). One potential reason for this is the higher GAD severity in this study, with baseline worry averaging 75 out of a possible 80, rather than 65 (Sijercic et al., 2016). Thus, this sample, also being larger than the Sijercic sample, may have had higher variability in ambivalent counter-change talk in order to detect effects. Furthermore, the emergence of change

talk as a predictor of *outcomes* was contrary to our expectations and previous research in CBT for GAD. Although change talk is consistently an important predictor in addictions, research in anxiety disorders has found it to be unrelated to outcomes (Hunter et al., 2014; Lombardi et al., 2014; Westra & Norouzian, 2018). Talk favouring change has been hypothesized to not predict outcomes in anxiety because these statements are 'throwaway statements', uttered simply because the client wishes to put their best foot forward in their first session with the therapist, and because the content of the conversation in session 1 pulls for articulating need and desire for treatment (Lombardi et al., 2014). In contrast, substance use disorders can be very severe, with high effects on functioning and increased stigma in relation to anxiety. It is possible that individuals with substance use disorders argue for change in session 1 honestly and with more conviction, sincerely hoping to escape the stigma and severity of their disorder. Similarly, this sample included only individuals with severe GAD, and thus the impact on functioning is likely greater than anxious samples with a wider range of severity. The participants in the present study may have been so severely anxious, that their desire to change is more marked, thus making these statements a true measure of motivation that has bearing on outcome. This would also explain recent significant change talk findings from Goodwin and colleagues (2017), as they also examined this severe GAD sample. Another important note is that change talk did not emerge as a predictor until one year after treatment was completed. Past studies examining change talk and outcomes, such as the Lombardi (2014) study cited throughout this paper, only looked at worry immediately following treatment. This study replicates the result that change talk is not associated with worry posttreatment, but discovers an effect when participants are assessed one year later.

When CBT alone was compared with MI-CBT, resistant talk against change was the only motivational language variable that differed between groups. Such statements were much less common among MI-CBT clients, indicating that resistant counter-change talk in particular is an index that may be sensitive to the impact of MI. The similar ambivalence rates, but markedly different resistant rates, indicate that MI-CBT therapists may be skilled at not allowing the client's ambivalence to progress into resistance. Through normalizing and encouraging clients to freely discuss their concerns, reservations, and fears about change, MI-CBT therapists create a context in which the client is safe to reveal any ambivalence about change that exists for them. In contrast, the more change-focused stance in CBT alone may lead such reservations to emerge as resistance or opposition. In fact, therapist direction in the context of client ambivalence is a highly reliable predictor of resistance (for a review see Westra & Norouzian, 2018). MI specifically focuses on identifying and dealing with ambivalence and resistance, and thus overall resistance is decreased when MI is integrated with CBT (Aviram et al., 2016; Constantino et al., 2017). The responsive implementation of MI skills during times of client ambivalence may prevent opposition, thereby lowering the incidence of resistant talk against change.

It is also noteworthy that the predictive capacity of motivational language increased over time. The variance accounted for by both types of counter-change talk almost doubled from post-treatment to 1-year follow-up, and change talk only emerged as a predictor at follow-up. This may be because *immediately* posttreatment, anxiety reduction depends on the ability of the client to implement the techniques they learned in therapy. However, in order to *maintain* these gains, the client must be motivated to *continue* using these techniques. Those who were less motivated may be compliant in using worry-reduction strategies during treatment, but may be prone to relapse at follow-up because they are lacking intrinsic motivation, which is important for

maintenance of gains (Davison et al., 1973). In other words, motivation may become a more critical factor as the distance from treatment, and distance from external encouragement to implement strategies, increases.

The null result of the Change Questionnaire on outcome is interesting to consider, as it is based on psycholinguistic analyses of client motivational speech and, therefore, categorizes motivation similarly to the MISC. Despite this, these two measures had very different predictive capacity. This emphasizes that the problem with motivational measures lies with self-report in general, as the same construct measured through observation had much more impressive performance. Moreover, while the self-report measures of motivation were significantly correlated to each other, they were not correlated with any of the motivational language variables. This implies that self-report measures are assessing a somewhat different concept of motivation to change. For example, self-report measures may instead measure how motivated one *wishes* to appear, resulting from social desirability bias. Alternatively, clients may not be accurately aware of their levels of motivation, possibly to reduce cognitive dissonance resulting from attending therapy when they aren't committed to change. Moreover, clients may not be fully aware of their reasons to change, desire to change etc., until they start discussing it in session. Waller (2012) has identified all of these factors as obstacles to measuring motivation in eating disorders, and this may also be the case in GAD.

In general, these findings underscore the importance of therapists monitoring motivation through observation rather than relying solely on client self-report. Sessions could be observed by arm's length coders after specific sessions (i.e. at the outset of therapy as measured in this study, or at other sessions partway through treatment), or if therapy is not progressing as expected. In addition, the effect of talk against change on outcomes implies that learning to

identify these moments in therapy may be critical. The effect of these therapeutic markers emphasizes the importance of process-centered training, so that markers of negative therapeutic process can be addressed as they occur (Westra & Constantino, in press). The findings also identify MI as a valuable tool to integrate with existing therapeutic techniques, because infusing it with other treatments may reduce these harmful processes. Clinicians can use the presence of resistant talk against change as a marker to switch to the supportive style of MI, thereby reducing the occurrence of future resistant statements. Learning to do so may provide clinicians the opportunity to enhance treatment outcome.

Strengths, Limitations, and Future Directions

This study directly tests the predictive ability of the MISC in comparison to commonly used self-report measures of motivation for anxiety, replicating and extending a previous study that had found promise with this measure. Client motivation has been widely considered to be a key factor in therapy, but the predictive capacity of in-session motivational language found in the current study indicates it may be even more important than previous self-report measures have indicated. These findings further support the centrality of client motivation for change to outcomes in CBT (Lombardi et al., 2014; Westra, 2012; Zuroff et al., 2007). The additional support for the MISC in the present study, replicating previous research, allows for advancement in research exploring how motivation impacts the process of clinical treatment in CBT for anxiety. For example, the relation of motivation to other important clinical variables could be explored, as well as changes in motivation over the course of treatment. To my knowledge, this study is also the first to examine how motivational language is affected by integrating Motivational Interviewing, and offers evidence that MI is an effective way to reduce harmful talk

against change, valuable knowledge for clinicians working with unmotivated or ambivalent clients.

A limitation of the present study is that it only included individuals with GAD in a CBT and MI-CBT context, and the majority of these individuals were Caucasian females. Future studies should examine the predictive capacity of motivational language in other and more diverse populations. This would help determine whether the predictive capacity of motivational language extends to other individuals, clinical contexts, and theoretical approaches beyond CBT. The clinicians in this study were also fairly inexperienced, being either doctoral or post-doctoral level psychologists. This could have an effect on treatment, however these clinicians were supervised by experienced psychotherapists, and research demonstrates that therapist experience does not affect psychotherapy outcome (Leon, Martinovich, Lutz, & Lyons, 2005).

Furthermore, treatment group was not controlled for in the models determining whether motivational language variables predicted outcome. Thus, we cannot say whether this effect is being driven by one specific treatment group (i.e., the CBT group), and if this effect would be decreased when treatment group is controlled for. Future studies should control for treatment group.

A further limitation is that the measurement of self-reported motivation and observed motivation occurred at different time points. Self-report measures were administered before treatment, whereas observed motivation was measured in the first session of treatment. This was necessary due to the nature of the study, as the motivation measured via the MISC requires an interaction between client and therapist, and the inclusion of the interpersonal measures (ambivalence versus resistance) requires this interpersonal context.

Finally, only participants with complete data were included in the post-treatment and follow-up analyses, which may make these results non-generalizable to dropout participants. Further, it is possible that the inclusion of these participants would have altered the effect of motivational variables on outcome, although dropout participants did not significantly differ on four of the five motivational measures used.

Future research should examine whether the effect of resistant counter-change talk is moderated by personality differences. Clients ranged widely in their frequency of this type of language. It is likely that this is not just a treatment effect, but a personality effect as well. Some individuals in this study may be naturally more oppositional or reactive, which may impact the effect of this variable on treatment outcome. Individual differences in reactance potential and locus of control have been hypothesized to affect levels of resistance (Bischoff & Tracey, 1995). Agreeableness, dominance, and extraversion are also of relevance to resistance, and their effect should be considered.

Future research should also examine how well therapists could identify the motivational language of their own clients. This study examined motivation measured by independent coders after sessions have been completed, and as discussed above, the significance of in-session language indicates that the ability for therapists to identify it in their own clients would be extremely useful. Although therapists have been found to be unreliable at identifying their own clients' motivation levels (Geller, 2002), it is possible that therapists may be able to quantify motivation in a more objective manner if they are trained in the MISC coding system. Studies should be conducted examining first how well therapists can code motivation via the MISC after sessions have occurred (i.e. when they aren't enmeshed in the client-therapist interaction), and then should examine whether it is possible for trained therapists to identify motivational

statements in the moment. Comparing these therapist ratings of motivation to unbiased coders would be telling.

Lastly, given that MI-CBT and CBT alone only differed on the amount of resistant talk against change, and that resistant talk against change was the most detrimental to outcome, future research should investigate whether decreased resistant counter-change talk is a mediator of improved outcome when infusing MI with CBT.

Conclusions

In sum, early in-session language regarding change, and specifically statements countering change, are important measures of motivation that significantly predict outcome in CBT for GAD. The effects of these motivational statements persist and even grow in predictive capacity as distance from treatment increases. The integration of MI with CBT decreases the frequency of the most harmful of these motivational statements: counter-change talk uttered in order to oppose the therapist/therapy. These findings have both clinical and research implications. They highlight the importance of identification and management of client motivation markers, and encourage research identifying the optimal ways for therapists to respond to these markers to prevent future occurrence (Westra & Constantino, in press). One possible response suggested by this research is the implementation of MI techniques to decrease resistant CCT and ultimately encourage CT. This research supports such responsive management of motivational process markers and tailoring treatment to individual differences in motivation (Constantino, Boswell, Bernecker, & Castonguay, 2013).

References

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text revision). Arlington, VA: American Psychiatric Press.

American Psychological Association. (2010). Division 12 Committee on building a two-way bridge between research and practice: Clinicians' experiences in using an empirically supported treatment for panic disorder. *The Clinical Psychologist, 64,* 10-20.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Press.

Amrhein, P. C., Miller, W. R., Yahne, C. E., Palmer, M., & Fulcher, L. (2003). Client commitment language during motivational interviewing predicts drug use outcomes. *Journal of Consulting and Clinical Psychology, 71,* 862-878. doi:10.1037/0022-006X.71.5.862

Apodaca, T. R., Borsari, B., Jackson, K. M., Magill, M., Longabaugh, R., Mastroleo, N. R., & Barnett, N. P. (2014). Sustain talk predicts poorer outcomes among mandated college student drinkers receiving a brief motivational intervention. *Psychology of Addictive Behaviors, 28,* 631-638. doi:10.1037/a0037296

Aviram, A., & Westra, H. A. (2011). The Impact of motivational interviewing on resistance in cognitive behavioral therapy. *Psychotherapy Research, 21,* 698–708. doi:10.1080/10503307.2011.610832

Aviram, A., Westra, H. A., Constantino, M. J., & Antony, M. M. (2016). Responsive management of early resistance in cognitive-behavioral therapy for generalized anxiety disorder. *Journal of Consulting and Clinical Psychology, 9,* 783-794. doi:10.1037/ccp0000100

Bachelor, A., Laverdière, O., Gamache, D., & Bordeleau, V. (2007). Clients' collaboration in therapy: Self-perceptions and relationships with client psychological functioning, interpersonal relations, and motivation. *Psychotherapy: Theory, Research, Practice, Training*, *44*, 175-192. doi:10.1037/0033-3204.44.2.175

Bischoff, M. M., & Tracey, T. J. G. (1995). Client resistance as predicted by therapist behavior: A study of sequential dependence. *Journal of Counseling Psychology, 42,* 487–495. doi:10.1037/0022-0167.42.4.487

Brehm, S. S., & Brehm, J. W. (2013). *Psychological reactance: A theory of freedom and control*. Academic Press.

Brown, T. A., Antony, M. M., & Barlow, D. H. (1992). Psychometric properties of the Penn State Worry Questionnaire in a clinical anxiety disorders sample. *Behaviour Research and Therapy, 30,* 33-37. doi:10.1016/0005-7967(92)90093-V

Button, M. L. (2013). Using in-session change talk and counter-change talk to predict engagement in cognitive-behavioural therapy (Unpublished manuscript). Department of Psychology, York University, Toronto, ON.

Button, M. L., Westra, H. A., & Hara, K. M. (2014, April). *Ambivalence and homework compliance in CBT*. Paper presented at meeting of the Society for the Exploration of Psychotherapy Integration, Montreal, QC.

Button, M. L., Westra, H. A., Hara, K. M., & Aviram, A. (2015). Disentangling the impact of resistance and ambivalence on therapy outcomes in cognitive behavioural therapy for generalized anxiety disorder. *Cognitive Behaviour Therapy, 44*, 44-53. doi:10.1080/16506073.2014.959038

Catley, D., Harris, K. J., Mayo, M. S., Hall, S., Okuyemi, K. S., Boardman, T., & Ahluwalia, J. S. (2006). Adherence to principles of motivational interviewing and client within-session behavior. *Behavioural and Cognitive Psychotherapy, 34*, 43-56. doi:10.1017/S1352465805002432

Chamberlain, P., Davis, J.P., Forgatch, M., Frey, J., Patterson, G.R., Ray, J., et al. (1985). The therapy process code: A multidimensional system for observing therapist and client interactions. Unpublished coding manual.

Chamberlain, P., Patterson, G., Reid, J., Kavanagh, K., & Forgatch, M. (1984). Observation of client resistance. *Behavior Therapy, 15,* 144–155. doi:10.1016/S0005-7894(84)80016-7

Collins, S. E., Malone, D. K., & Larimer, M. E. (2012). Motivation to change and treatment attendance as predictors of alcohol-use outcomes among project-based Housing First residents. *Addictive Behaviors*, *37*, 931-939. doi:10.1016/j.addbeh.2012.03.029

Constantino, M. J., Boswell, J. F., Bernecker, S. L., & Castonguay, L. G. (2013). Context-responsive psychotherapy integration as a framework for a unified clinical science: Conceptual and empirical considerations. *Journal of Unified Psychotherapy and Clinical Science Volume*, *2*, 1-20.

Constantino, M. J., Westra, H. A., Antony, M. M., & Coyne, A. E. (2017, June). Specific and common processes as mediators of the long-term effects of cognitive-behavioral therapy integrated with motivational interviewing for generalized anxiety disorder. *Psychotherapy Research*. Advance online publication. doi:10.1080/10503307.2017.1332794

Davison, G. C., Tsujimoto, R. N., & Glaros, A. G. (1973). Attribution and the maintenance of behavior change in falling asleep. *Journal of Abnormal Psychology, 82,* 124-133. doi:/10.1037/h0034965

Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of Research in Personality, 19,* 109-134. doi:10.1016/0092-6566(85)90023-6

Dozois, D. J., Westra, H. A., Collins, K. A., Fung, T. S., & Garry, J. K. (2004). Stages of change in anxiety: Psychometric properties of the University of Rhode Island Change Assessment (URICA) scale. *Behaviour Research and Therapy, 42,* 711-729. doi:10.1016/S0005-7967(03)00193-1

Field, C. A., Adinoff, B., Harris, T. R., Ball, S. A., & Carroll, K. M. (2009). Construct, concurrent and predictive validity of the URICA: Data from two multi-site clinical trials. *Drug and Alcohol Dependence, 101,* 115-123. doi:10.1016/j.drugalcdep.2008.12.003

Fleiss, J. L. (1981). *Statistical methods for rates and proportions* (2nd ed.). New York, NY: John Wiley & Sons.

Gaume, J., Bertholet, N., Daeppen, J. B., & Gmel, G. (2013). The Change Questionnaire predicts change in hazardous tobacco and alcohol use. *Addictive Behaviors, 38*(11), 2718-2723.Wiley and Sons. doi:10.1016/j.addbeh.2013.07.004

Geller, J. (2002). Estimating readiness for change in anorexia nervosa: Comparing clients, clinicians, and research assessors. *International Journal of Eating Disorders, 31*(3), 251-260. doi:10.1002/eat.10045

Geller, J., Brown, K. E., Zaitsoff, S. L., Menna, R., Bates, M. E., & Dunn, E. C. (2008). Assessing readiness for change in adolescents with eating disorders. *Psychological Assessment, 20*(1), 63. doi:10.1037/1040-3590.20.1.63

Geller, J., Cockell, S. J., & Drab, D. L. (2001). Assessing readiness for change in the eating disorders: The psychometric properties of the readiness and motivation interview. *Psychological assessment, 13*(2), 189. doi:10.1037/1040-3590.13.2.189

Geller, J., & Drab, D. L. (1999). The readiness and motivation interview: a symptom-specific measure of readiness for change in the eating disorders. *European Eating Disorders Review: The Professional Journal of the Eating Disorders Association, 7*(4), 259-278. doi:10.1002/(SICI)1099-0968(199908)7:4<259::AID-ERV295>3.0.CO;2-6

Glynn, L. H., & Moyers, T. B. (2009). *Manual for the motivational interviewing skill code (MISC), version 1.1: Addendum to MISC 1.0*. Retrieved from the University of New Mexico Center on Alcoholism, Substance Use and Addictions Website: http://casaa.unm.edu. Retrieved December 20, 2013.

Goodwin, B. J., Constantino, M. J., Westra, H. A., Button, M. L., & Antony, M. M. (2015, June). *Motivational language as a predictor of change and time to response in psychotherapy for generalized anxiety disorder*. Paper presented at the Meeting of the Society for Psychotherapy Research, Philadelphia, PA.

Goodwin, B. J., Constantino, M. J., Westra, H. A., Button, M. L., & Antony, M. M. (2017, June). *Client motivational language as a predictor of change in worry during acute treatment for generalized anxiety disorder*. Paper presented at the Meeting of the Society for Psychotherapy Research, Toronto, ON.

Hunter, J. A., Button, M. L., & Westra, H. A. (2014). Ambivalence and alliance ruptures in cognitive behavioral therapy for generalized anxiety. *Cognitive Behaviour Therapy, 43*, 201-208. doi:10.1080/16506073.2014.899617

Jungbluth, N. J., & Shirk, S. R. (2009). Therapist strategies for building involvement in cognitive-behavioral therapy for adolescent depression. *Journal of Consulting and Clinical Psychology, 77*, 1179–1184. doi:10.1037/a0017325

Kampman, M., Keijsers, G. P., Hoogduin, C. A., & Hendriks, G. J. (2008). Outcome prediction of cognitive behaviour therapy for panic disorder: Initial symptom severity is predictive for treatment outcome, comorbid anxiety or depressive disorder, cluster C personality disorders and initial motivation are not. *Behavioural and Cognitive Psychotherapy, 36*, 99-112. doi:10.1017/S1352465807004018

Keijsers, G. P., Hoogduin, C. A., & Schaap, C. P. (1994). Prognostic factors in the behavioral treatment of panic disorder with and without agoraphobia. *Behavior Therapy, 25*(4), 689-708. doi:10.1016/S0005-7894(05)80204-7

Leon, S. C., Martinovich, Z., Lutz, W., & Lyons, J. S. (2005). The effect of therapist experience on psychotherapy outcomes. *Clinical Psychology and Psychotherapy, 12*, 417-426. doi:10.1002/cpp.473

Lombardi, D. R., Button, M. L., & Westra, H. A. (2014). Measuring motivation: Change talk and counter-change talk in cognitive behavioral therapy for generalized anxiety. *Cognitive Behaviour Therapy, 43*, 12-21. doi:10.1080/16506073.2013.846400

Magill, M., Apodaca, T. R., Barnett, N. P., & Monti, P. M. (2010). The route to change: Within-session predictors of change plan completion in a motivational interview. *Journal of Substance Abuse Treatment, 38*, 299–305. doi:10.1016/j.jsat.2009.12.001

Magill, M., Gaume, J., Apodaca, T. R., Walthers, J., Mastroleo, N. R., Borsari, B., & Longabaugh, R. (2014). The technical hypothesis of motivational interviewing: A meta-analysis of MI's key causal model. *Journal of Consulting and Clinical Psychology, 82*, 973-983. doi:10.1037/a0036833

Mamedova, K., Westra, H. A., Constantino, M. J., & Antony, M. M. (2016, June). *Initial Expectations as a Moderator of the Impact of Resistance on Outcome Expectations in Cognitive-Behavioral Therapy*. Paper presented at the meeting of the Society for the Exploration of Psychotherapy Integration, Dublin, Ireland.

Meier, P. S., Donmall, M. C., Barrowclough, C., McElduff, P., & Heller, R. F. (2005). Predicting the early therapeutic alliance in the treatment of drug misuse. *Addiction*, *100*(4), 500-511. doi:10.1111/j.1360-0443.2005.01031.x

Meyer, T. J., Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990). Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy*, *28*, 487–495. doi:10.1016/0005-7967(90)90135-6

Miller, W. R., Benefield, R. G., & Tonigan, J. S. (1993). Enhancing motivation for change in problem drinking: a controlled comparison of two therapist styles. *Journal of Consulting and Clinical Psychology, 65*, 455. doi:10.1037/0022-006X.61.3.455

Miller, W. R., & Johnson, W. R. (2008). A natural language screening measure for motivation to change. *Addictive Behaviors, 33*, 1177–1182. doi:10.1016/j.addbeh.2008.04.018

Miller, W. R., & Rollnick, S. (2013). *Motivational interviewing: Helping people change* (3rd ed.). New York, NY: Guilford Press.

Miller, W. R., & Tonigan, J. S. (1996). Assessing drinkers' motivation to change: The Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES). *Psychology of Addictive Behaviors, 10,* 81–89. doi:10.1037//0893-164X.10.2.81.

Moyers, T. B., Martin, T., Christopher, P. J., Houck, J. M., Tonigan, J. S., & Amrhein, P. C. (2007). Client language as a mediator of motivational interviewing efficacy: Where is the evidence? *Alcoholism: Clinical and Experimental Research, 31,* 40-47. doi:10.1111/j.1530-0277.2007.00492.x

Moyers, T. B., Martin, T., Houck, J. M., Christopher, P. J., & Tonigan, J. S. (2009). From in-session behaviors to drinking outcomes: A causal chain for motivational interviewing. *Journal of Consulting and Clinical Psychology, 77,* 1113–1124. doi:10.1037/a0017189

Patterson, G. R., & Forgatch, M. S. (1985). Therapist behavior as a determinant for client noncompliance: A paradox for the behavior modifier. *Journal of Consulting and Clinical Psychology, 53,* 846–851. doi:10.1037/0022-006X.53.6.846

Pelletier, L.G., Tuson, K.M., & Haddad, N. K. (1997). Client motivation for therapy scale: A measure of intrinsic motivation, extrinsic motivation, and amotivation for therapy. *Journal of Personality Assessment, 68,* 414–435. doi:10.1207/s15327752jpa6802_11

Pinto, A., Pinto, A. M., Neziroglu, F., & Yaryura-Tobias, J. A. (2007). Motivation to change as a predictor of treatment response in obsessive compulsive disorder. *Annals of Clinical Psychiatry*, *19*, 83-87. doi:10.1080/10401230701334747

Ryan, R. M., Plant, R. W., & O'Malley, S. (1995). Initial motivations for alcohol treatment: Relations with patient characteristics, treatment involvement, and dropout. *Addictive behaviors*, *20*, 279-297. doi:10.1016/0306-4603(94)00072-7

Sijercic, I., Button, M. L., Westra, H. A., & Hara, K. M. (2016). The interpersonal context of client motivational language in cognitive behavioral therapy. *Psychotherapy, 53*, 13–21. doi:10.1037/pst0000017

Vader, A. M., Walters, S. T., Prabhu, G. C., Houck, J. M., & Field, C. A. (2010). The language of motivational interviewing and feedback: Counselor language, client language, and client drinking outcomes. *Psychology of Addictive Behaviors, 24*, 190–197. doi:10.1037/a0018749

Vogel, P. A., Hansen, B., Stiles, T. C., & Götestam, K. G. (2006). Treatment motivation, treatment expectancy, and helping alliance as predictors of outcome in cognitive behavioral treatment of OCD. *Journal of Behavior Therapy and Experimental Psychiatry*, *37*, 247-255. doi:10.1016/j.jbtep.2005.12.001

Waller, G. (2012). The myths of motivation: time for a fresh look at some received wisdom in the eating disorders?. *International Journal of Eating Disorders*, *45*(1), 1-16. doi:10.1002/eat.20900

Westra, H. A. (2011). Comparing the predictive capacity of observed in-session resistance to self-reported motivation in cognitive behavioral therapy. *Behaviour Research and Therapy, 49*, 106-113. doi:10.1016/j.brat.2010.11.007

Westra, H. A. (2012). *Motivational interviewing in the treatment of anxiety*. Guilford Press.

Westra, H. A., Arkowitz, H., & Dozois, D. J. A. (2009). Adding a motivational interviewing pretreatment to cognitive behavioral therapy for generalized anxiety disorder: A preliminary randomized controlled trial. *Journal of Anxiety Disorders, 23*, 1106–1117. doi:10.1016/j.janxdis.2009.07.014

Westra, H. A., & Aviram, A. (2013). Core skills in motivational interviewing. *Psychotherapy, 50*, 273. doi:10.1037/a0032409

Westra, H. A., Aviram, A., Kertes, A., Ahmed, M., & Connors, L. (2009). *Manual for rating resistance in CBT* (Unpublished manuscript). York University, Toronto.

Westra, H.A. & Constantino, M.J. (in press). Integrating motivational interviewing into cognitive-behavioral therapy for generalized anxiety disorder: A process marker driven approach. In J. Norcross & M. Goldfried (Eds.), *Handbook of Psychotherapy Integration* (3rd ed.).

Westra, H. A., Constantino, M. J., & Antony, M. M. (2016). Integrating motivational interviewing with cognitive-behavioral therapy for severe generalized anxiety disorder: An allegiance-controlled randomized clinical trial. *Journal of Consulting and Clinical Psychology, 84,* 768-782. doi:10.1037/ccp0000098

Westra, H. A., & Norouzian, N. (2018). Using motivational interviewing to manage process markers of ambivalence and resistance in cognitive behavioral therapy. *Cognitive Therapy and Research*. doi:10.1007/s10608-017-9857-6

Wilson, M., Bell-Dolan, D., & Beitman, B. (1997). Application of the stages of change scale in a clinical drug trial. *Journal of Anxiety Disorders*, *11*(4), 395-408. doi:10.1016/S0887-6185(97)00018-2

Zickgraf, H. F., Chambless, D. L., McCarthy, K. S., Gallop, R., Sharpless, B. A., Milrod, B. L., & Barber, J. P. (2015). Interpersonal factors are associated with lower therapist adherence in cognitive-behavioural therapy for panic disorder. *Clinical Psychology and Psychotherapy, 23*, 272-284. doi:10.1002/cpp.1955

Zuroff, D. C., Koestner, R., Moskowitz, D. S., McBride, C., Marshall, M., & Bagby, M. R. (2007). Autonomous motivation for therapy: A new common factor in brief treatments for depression. *Psychotherapy Research, 17*, 137-147. doi:10.1080/10503300600919380

Table 1. Sample demographic characteristics and descriptive statistics

Measure	Total Sample	CBT (*n* = 43)	MI-CBT (*n* = 42)
PSWQ			
Baseline	*M*=74.87, *SD*=3.42	*M*=75.05, *SD*=3.43	*M*=74.69, *SD*=3.44
Posttreatment	*M*=43.89, *SD*=17.02	*M*=41.24, *SD*=17.79	*M*=46.18, *SD*=16.21
1-year posttreatment	*M*=40.28, *SD*=16.21	*M*=42.85, *SD*=18.37	*M*=37.92, *SD*=13.79
CQ	*M*=104.45, *SD*=10.53	*M*=107.23, *SD*=8.76	*M*=101.60, *SD*=11.50
CMOTS	*M*=69.25, *SD*=14.35	*M*=71.40, *SD*=12.28	*M*=67.10, *SD*=16.02
CT	*M*=17.81, *SD*=11.19	*M*=16.28, *SD*=7.72	*M*=19.38, *SD*=13.81
CCT-A	*M*=9.96, *SD*=6.62	*M*=10.21, *SD*=6.34	*M*=9.70, *SD*=6.96
CCT-R	*M*=1.20, *SD*=2.10	*M*=1.83, *SD*=2.66	*M*=.55, *SD*=.96
Sex	75 female, 10 male	41 female, 2 male	34 female, 8 male
Age (years)	*M*=33.33, *SD*=11.23	*M*=34.19, *SD*=11.92	*M*=32.45, *SD*=10.54
Ethnic Group	60 Caucasian 11 Asian 3 Hispanic 2 African Canadian 9 Multiracial/other	32 Caucasian 5 Asian 2 Hispanic 0 African Canadian 4 Multiracial/other	28 Caucasian 6 Asian 1 Hispanic 2 African Canadian 5 Multiracial/other
Marital status	47 cohabitating 33 never married 4 separated 1 widowed	23 cohabitating 16 never married 2 separated 1 widowed	24 cohabitating 17 never married 1 separated
Medication Status	18 medicated 67 unmedicated	13 medicated 30 unmedicated	5 medicated 37 unmedicated
Highest level of education	1 elementary 27 high school 57 postsecondary	1 elementary 16 high school 26 postsecondary	0 elementary 11 high school 31 postsecondary
Worry chronicity (in years)	12.22 (.75-45)	13.43 (1-45)	10.98 (.75-43)
Comorbidity	68 comorbid disorders 60 other anxiety 30 depression	37 comorbid disorders 31 other anxiety 17 depression	32 comorbid disorders 29 other anxiety 13 depression

Note. CBT = Cognitive-Behavioural Therapy; MI-CBT = Motivational Interviewing integrated with Cognitive-Behavioural Therapy. PSWQ = Penn State Worry Questionnaire; CQ = Change Questionnaire; CMOTS = Client Motivation for Therapy Scale; CT = change talk; CCT-A = ambivalent counter-change talk; CCT-R = resistant counter-change talk

Table 2. Correlations between measures

Measure	1	2	3	4	5	7	8	9
1. CQ	----	.37**	.21	-.11	-.03	.15	-.25*	-.05
2. CMOTS		----	.01	-.20	-.12	-.09	-.23	-.09
3. CT			----	.34**	-.01	-.04	-.11	-.15
4. CCT-A				----	.10	.02	.33**	.38**
5. CCT-R					----	.15	.35**	.44***
7. PSWQ pre						----	-.00	-.11
8. PSWQ post							----	.64***
9. PSWQ 1yr								----

Note. CQ = Change Questionnaire; CMOTS = Client Motivation for Therapy Scale; CT = change talk; CCT-A = ambivalent counter-change talk; CCT-R = resistant counter-change talk; PSWQ = Penn State Worry Questionnaire. *$p < .05$, **$p < .01$, ***$p < .001$.

Table 3. Multilevel modelling analyses of motivational measures on worry outcomes

Step	*β*	*t*	*p*	R^2
PSWQ posttreatment (*n* = 69)				
(1) PSWQ pretreatment	<.001	<.001	.99	
(2) Self-report motivation				.06
CQ	-.36	-1.47	.15	
CMOTS	-.15	-.92	.36	
(3) Observed motivation				.27
CT	-.32	-1.90	.06	
CCT-A	.91	3.10	.004**	
CCT-R	2.29	2.65	.011*	
				ΔR^2 = .21***
PSWQ 1-year posttreatment (*n* = 67)				
(1) PSWQ pretreatment	.51	.88	.38	
(2) Self-report motivation				.00
CQ	-.15	-.61	.54	
CMOTS	-.04	-.26	.80	
(3) Observed motivation				.38
CT	-.41	-2.54	.02*	
CCT-A	1.03	3.90	.001***	
CCT-R	2.78	3.55	.001***	
				ΔR^2 =.38***

Note. PSWQ = Penn State Worry Questionnaire; CQ = Change Questionnaire; CMOTS = Client Motivation for Therapy Scale; CT = change talk; CCT-A = ambivalent counter-change talk; CCT-R = resistant counter-change talk. *p < .05, **p < .01, ***p < 0.001.

Table 4. Motivational language differences between treatment groups

	CBT (n = 43)	MI-CBT (n = 42)			
Language variable	*M* (*SD*)	*M* (*SD*)	*β*	*t*	*p*
CT	16.28 (7.72)	19.38 (13.81)	2.90	1.11	.27
CCT-A	10.21(6.34)	9.70 (6.96)	-1.14	-.75	.46
CCT-R	1.83 (2.66)	.55 (.96)	-1.27	-2.74	.013*

Note. CBT = Cognitive-Behavioural Therapy; MI-CBT = Motivational Interviewing integrated with Cognitive-Behavioural Therapy; CT = change talk; CCT-A = ambivalent counter-change talk; CCT-R = resistant counter-change talk. Multilevel modelling controlling for therapist effects. *$p < .05$.

Appendix A: Penn State Worry Questionnaire

PSWQ

Instructions. Please read the following statements and rate the degree to which each describes you "on average" in the past week. Use the following scale.

1	2	3	4	5
Not at all typical of me		Somewhat typical of me		Very typical of me

____ 1. I worry if I do not have enough time to do everything

____ 2. My worries overwhelm me

____ 3. I tend to worry about things

____ 4. Many situations make me worry

____ 5. I know I should not worry about things, but I just cannot help it

____ 6. When I am under pressure I worry a lot

____ 7. I am always worried about something

____ 8. I find it hard to dismiss worrisome thoughts

____ 9. As soon as I finish one task, I start to worry about everything else I have to do

____ 10. I always worry about everything

____ 11. Even when there is nothing more I can do about a concern, I continue to worry about it

____ 12. I have been a worrier all my life

____ 13. I notice that I have been worrying about things

____ 14. Once I start worrying, I cannot stop

____ 15. I worry all the time

____ 16. I worry about projects until they are done

Appendix B: Change Questionnaire

CQ

For each question below, please circle the one number that best describes where you are right now on reducing worry.

1. I ***want*** to reduce my worry	0 Definitely Not	1	2	3 Probably Not	4	5 Maybe	6	7 Probably	8	9 10 Definitely
2. I ***could*** reduce my worry	0 Definitely Not	1	2	3 Probably Not	4	5 Maybe	6	7 Probably	8	9 10 Definitely
3. There are ***good reasons*** for me to reduce my worry	0 Definitely Not	1	2	3 Probably Not	4	5 Maybe	6	7 Probably	8	9 10 Definitely
4. I ***have*** to reduce my worry	0 Definitely Not	1	2	3 Probably Not	4	5 Maybe	6	7 Probably	8	9 10 Definitely
5. I ***intend*** to reduce my worry	0 Definitely Not	1	2	3 Probably Not	4	5 Maybe	6	7 Probably	8	9 10 Definitely
6. I am ***trying*** to reduce my worry	0 Definitely Not	1	2	3 Probably Not	4	5 Maybe	6	7 Probably	8	9 10 Definitely
7. I ***hope*** to reduce my worry	0 Definitely Not	1	2	3 Probably Not	4	5 Maybe	6	7 Probably	8	9 10 Definitely
8. I ***can*** reduce my worry	0 Definitely Not	1	2	3 Probably Not	4	5 Maybe	6	7 Probably	8	9 10 Definitely
9. It is ***important*** for me to reduce my worry	0 Definitely Not	1	2	3 Probably Not	4	5 Maybe	6	7 Probably	8	9 10 Definitely
10. I ***need*** to reduce my worry	0 Definitely Not	1	2	3 Probably Not	4	5 Maybe	6	7 Probably	8	9 10 Definitely
11. I am ***going*** to reduce my worry	0 Definitely Not	1	2	3 Probably Not	4	5 Maybe	6	7 Probably	8	9 10 Definitely
12. I am ***doing things*** to reduce my worry	0 Definitely Not	1	2	3 Probably Not	4	5 Maybe	6	7 Probably	8	9 10 Definitely

Appendix C: Client Motivation for Therapy Scale

Client Motivation for Therapy Scale (CMOTS)

WHY ARE YOU PRESENTLY INVOLVED IN THERAPY?

Using the scale below, please indicate to what extent each of the following items corresponds to the reasons why you are presently involved in therapy by circling the appropriate number to the right of each item. We realize that the reasons why you are in therapy at this moment may differ from the reasons that you initially began therapy. However, we are interested to know why you are in therapy at the present moment.

1 = Does not correspond at all
2…
3…
4 = Corresponds moderately
5…
6…
7 = Corresponds exactly

1. For the pleasure I experience when I feel completely absorbed in a therapy session.
2. For the satisfaction I have when I try to achieve my personal goals in the course of therapy.
3. Because I would like to make changes to my current situation.
4. Because I believe that eventually it will allow me to feel better.
5. Because I experience pleasure and satisfaction when I learn new things about myself that I didn't know before.
6. Because I believe that therapy will allow me to deal with things better.
7. For the interest I have in understanding more about myself.
8. Because through therapy I've come to see a way that I can continue to approach different aspects of my life.
9. Because through therapy I feel that I can now take responsibility for making changes in my life.
10. Because I believe it's a good thing to do to find solutions to my problem.
11. Because I feel that changes that are taking place through therapy are becoming part of me
12. Because I value the way therapy allows me to make changes in my life.