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Comparing the Predictive Capacity of Observed In-Session Resistance to Self-Reported Motivation in Cognitive Behavioral Therapy

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Abstract

Self-report measures of motivation for changing anxiety have been weakly and inconsistently related to outcome in cognitive behavioral therapy (CBT). While clients may not be able to accurately report their motivation, ambivalence about change may nonetheless be expressed in actual therapy sessions as opposition to the direction set by the therapist (i.e., resistance). In the context of CBT for generalized anxiety disorder, the present study compared the ability of observed in-session resistance in CBT session 1 and two self-report measures of motivation for changing anxiety (the Change Questionnaire & the Client Motivational for Therapy Scale) to (1) predict client and therapist rated homework compliance (2) predict post-CBT and one-year post-treatment worry reduction, and (3) differentiate those who received motivational interviewing prior to CBT from those who received no pretreatment. Observed in-session resistance performed very well on each index, compared to the performance of self-reported motivation which was inconsistent and weaker relative to observed resistance. These findings strongly support both clinician sensitivity to moments of client resistance in actual therapy sessions as early as session 1, and the inclusion of observational process measures in CBT research.

Keywords

resistance; motivation; anxiety; cognitive behavioral therapy; predictors

Client motivation for change is widely regarded as central to outcomes in action-oriented treatments such as cognitive behavioral therapy (CBT; Antony, Ledley, & Heimberg, 2005; Arkowitz, Westra, Miller, & Rollnick, 2008). Multiple self-report measures of motivation have been developed or adapted from other problem domains in an attempt to measure motivation for change in common disorders treated using CBT such as anxiety and depression. Most of the research evaluating these instruments has been focused on their ability to predict outcomes in CBT for anxiety disorders. Existing measures reliably predict treatment dropout (e.g., Brogan, Prochaska, & Prochaska, 1999; Dozois, Westra, Collins, Fung, & Garry, 2004; Keijsers, Kampman, & Hoogduin, 2001) but not treatment outcome. Some investigators have reported small but significant relationships between self-reported motivation and CBT outcomes for anxiety (e.g., de Haan et al., 1997; Keijsers, Hoogduin, & Schaap, 1994a; 1994b) while others have found no relationship (e.g., Dozois et al., 2004;

Kampman, Keijsers, Hoogduin, & Hendriks, 2008; Vogel, Hansen, Stiles, & Gotestam, 2006). Consequently, despite the widespread recognition of the importance of motivation to CBT outcomes for anxiety, adequate self-report measures of motivation that would prove clinically useful in differentiating treatment response are lacking. In addition to definitional problems (e.g., Keijsers et al., 1999), self-report measures of motivation may be prone to social desirability bias (i.e., ceiling effects) and therefore may not accurately reflect client motivation and lack sufficient variability to predict outcomes.

While clients may be understandably reluctant to report themselves as less than optimally interested in reducing highly aversive affective states such as anxiety, ambivalence about change may nonetheless emerge in actual treatment sessions, expressed interpersonally as opposition to the direction of the therapist. In fact, in the literature on motivation, resistance and noncompliance in therapy are commonly regarded as manifestations of low motivation or ambivalence about change (Engle & Arkowitz, 2006; Miller & Rollnick, 2002; Westra & Arkowitz, 2010) that are reliably triggered by therapist directiveness or demands for change (e.g., Beutler, Harwood, Michelson, Song, & Holman, in press; Miller, Benefield, & Tonigan, 1993; Patterson & Forgatch, 1985). In this context, resistance to therapist direction is conceptualized as a behavioral expression of ambivalence about change or treatment; it represents a signal that the therapist is pushing the client to make changes or move in directions for which they are not yet ready (Miller & Rollnick, 2002; Moyers & Rollnick, 2002). As such resistance can be considered an indirect measure of client motivation or ambivalence about change or treatment.

Newman (1994) outlines various forms that resistance can take in CBT including refusal to follow through with homework, taking actions that run counter to what was agreed upon in session, high levels of expressed emotion toward the therapist, in-session avoidance such as silence or frequent use of “I don’t know”, gratuitous debates with the therapist, and misinterpretation of the therapist’s comments, among others. Expressions of resistance in CBT have also been observed to indicate misalliances, lack of collaboration on tasks and goals and clients’ opposition to therapist formulation of the clients’ problems (Watson & McCullen, 2005).

There is strong and consistent evidence that the effectiveness of psychotherapy is associated with the relative absence of resistance (Beutler et al., in press; Beutler et al., 2002). And even resistance observed as early as session 1 of CBT has been found to be highly predictive of subsequent homework compliance and outcomes in CBT (Aviram, Westra, & Kertes, 2010). For example, Jungbluth and Shirk (2009) noted that even though observed resistance levels in CBT session 1 for a group of depressed adolescents were quite low, higher resistance significantly predicted the total number of sessions completed. Resistance was a substantive predictor of CBT task involvement in subsequent sessions, accounting for 33% of the variance in subsequent involvement. As such, observations of behavioral exemplars of resistance early in CBT may be better able to capture client reluctance regarding treatment or change compared to client self-report of their own level of motivation.

The present study compared the relative capacity of early observed in-session resistance (CBT Session 1) to two client self-reported measures of motivation taken prior to CBT for generalized anxiety disorder (GAD). Measures were compared on three indices: (1) subsequent homework compliance, both client and therapist rated 2) post-CBT and one-year post-treatment worry reduction as measured by both client self-report and clinician administered diagnostic assessment and (3) ability to differentiate those who received motivational interviewing (MI) prior to CBT from those who did not receive a pretreatment. It was expected that observed resistance would perform well on each index, and would outperform self-report measures of motivation.

Method

Data for the present study derive from a larger randomized controlled trial (RCT) investigating the efficacy of adding a motivational interviewing (MI) pre-treatment, compared to no pre-treatment (4 week waiting period), prior to CBT for GAD (Westra, Arkowitz, & Dozois, 2009). For the evaluation of the capacity of each measure to predict homework compliance and outcome, the CBT alone group (no pre-treatment; N=38) was used in order to avoid any influence of having received MI on these measures. For the last index, differentiating motivation levels between those who received MI prior to CBT and those who did not, resistance coding data were available for a subset of individuals in the MI-CBT group (N=19; those of high worry severity at baseline) and this group was compared to the comparable group of individuals of high worry severity (N=18) receiving CBT alone (with no pre-treatment).

Participants and Selection

Participants were recruited from community advertisements in the greater Toronto area. All participants had a principal diagnosis of GAD based on the administration of the Anxiety Disorders Interview Schedule for DSM-IV (ADIS-IV: Brown, DiNardo, & Barlow, 1994). Clients were not engaged in any concurrent psychotherapy, not on benzodiazepine medication, and if they were concurrently using an antidepressant, they were required to be on a stable dose at study entry and to remain on that dose throughout the study.

Measures: Self-Report Measures

Change Questionnaire—(CQ: Miller & Johnson, 2008). The CQ is a recently developed 12 item measure derived from psycholinguistic research on natural language used by clients to describe their own motivation (Amrhein, Miller, Yahne, Palmer, & Fulcher, 2003). First, the respondent identifies what they are considering changing (in the present study this was completed for all participants as ‘to worry less’) and items are completed with reference to that change. Two items each represent desire, ability, reasons, need, commitment to change, as well as taking steps to change and are rated on a 0 (definitely not) to 10 (definitely) scale according to the degree that each statement describes their motivation (e.g., I want to worry less, I could worry less, etc.). Scores range from 0 to 120 with higher scores indicating higher levels of change-talk / motivation. The CQ has good internal consistency and test-retest reliability (Miller & Johnson, 2008).

The Client Motivation for Psychotherapy Scale—(CMOTS: Pelletier, Tuson, & Haddad, 1997). The CMOTS is a 24-item measure of client motivation for therapy based on the Self-Determination Theory of Deci and Ryan (1985) which postulates six different types of motivation falling on a continuum of autonomy. In ascending order from least to most intrinsic sources of motivation, they are: amotivation, external regulation, introjected regulation, identified regulation, integrated regulation, and intrinsic motivation. The CMOTS yields subscale scores for each type of motivation, with higher scores reflecting higher levels of each type of motivation. After initial scale development, Pelletier et al. gave the CMOTS to 140 clients receiving therapy from different therapists in the community. They found that the scale had good internal consistency, conformed to the theoretically-derived factor structure and possessed good convergent and discriminant validity. Zuroff et al. (2007) reported that higher scores on the CMOTS were associated with increased rates of short- and long-term improvement in three different types of psychotherapy for depression. And while the CMOTS failed to predict outcome in the Westra et al. (2009) study, those of high worry severity at baseline reported greater increases in intrinsic motivation from change from pre to post MI, compared to those of moderate worry severity. Following Pelletier et al., two subscale scores were calculated reflecting more self-determined

motivation (average of identified, integrated & intrinsic motivation) and less self-determined motivation (average of amotivation, external & introjected regulation).

Homework Compliance Scale—(HCS: Primakoff, Epstein, & Covi, 1986). Clients rated their degree of homework compliance throughout CBT using the single item HCS. Scores range from 0 (Homework was not assigned) to 6 (I did more of the assigned homework than requested), with higher scores reflecting higher levels of homework compliance. Higher scores on the HCS have been associated with more positive outcome in CBT (Bryant, Simons, & Thase, 1999; Taft, Murphy, King, Musser, & DeDeyn, 2003). Values of zero were deleted (7 instances in 304 scores in this data set) since homework compliance can only be assessed if homework was assigned.

Penn State Worry Questionnaire—(PSWQ: Meyer et al., 1990). The PSWQ, a widely used 16-item instrument assessing trait worry, was employed as the principal outcome measure. The PSWQ possesses high internal consistency and temporal stability, as well as good convergent and discriminant validity (Brown, Antony, & Barlow, 1992; Meyer et al.). It also differentiates individuals with GAD from those with other anxiety disorders (Brown et al.). Scores range from 16-80, with higher scores indicating greater worry.

Observer Rated Measure

Client Resistance Code—(CRC: Chamberlain et al., 1985). Resistance in the CRC is defined as any behavior which opposes, blocks, diverts, or impedes the direction set by the therapist. Resistance can be expressed either directly (i.e., verbal statements such as “I do the breathing and it helps but it doesn’t fix it”, or “I just hate writing things down”) or indirectly (i.e., in process - such as disagreeing, ignoring, interrupting, etc.). The CRC consists of 11 categories of resistant behavior. The CRC has been shown to possess good construct and predictive validity (Chamberlain Patterson, Reid, Kavanagh, & Forgatch, 1984; Patterson & Forgatch, 1985) as well as face and content validity (Bischoff & Tracey, 1995).

In the present study, the 11 resistance categories were collapsed and the CRC was adapted to capture resistance in CBT for GAD (Westra, Aviram, Kertes, Ahmed, & Connors, 2009[1]). CBT session 1 videotapes were first divided into 30 second time bins using a software platform for managing observations of videotaped data, Observer XT 9.0 (Noldus Information Technology, 2009). Trained coders rated each 30 second time bin for peak resistance on the following scale: 0=no resistance/co-operation, 1=minimal, qualified resistance, 2=clear, unqualified resistance, 3=hostility/confrontation. An average resistance score for the entire first session of CBT was then calculated. Higher scores indicate higher levels of resistance. The team of coders consisted of four graduate students in clinical psychology who were trained over a period of one year by reviewing, coding, and discussing samples of videotape in bi-weekly meetings until reliability was achieved. Coders were blind to client outcome or pretreatment status and coded sessions independently. Interrater reliability, as assessed by ICCs, was calculated by double-coding 20% of all tapes. The two-way mixed model, absolute agreement single-measures ICCs ranged from .73 to .87, indicating good to excellent agreement.

Clinician Completed Measures

Anxiety Disorders Interview Schedule IV—(ADIS IV; Brown et al., 1994). The ADIS IV is a well established, widely used diagnostic interview for anxiety and related disorders. ADIS-IV interviews were conducted by advanced clinical psychology graduate students

[1]The manual adapting the CRC for anxiety can be obtained from hwestra@yorku.ca.

who were trained to criterion in the administration of this diagnostic instrument. Interviewers also completed severity ratings of GAD and of comorbid diagnoses. Inter-rater reliability based on a random sample of 20% of audiotaped interviews for those who were successfully enrolled in the study was good, with an overall kappa for all diagnoses of .75, and 1.0 for GAD. The correlation between raters for GAD severity was $r = .79$, $p<.001$.

Therapist Rated Homework Compliance—Therapists also completed the HCS on their client's level of homework compliance (described above).

Treatments

CBT Treatment—Treatment followed the manual developed by Borkovec and his colleagues (Borkovec & Costello, 1993; Borkovec & Mathews, 1988; Borkovec et al., 2002) which focuses the core features of GAD: chronic hyperarousal, uncontrollable worry, and inhibited emotional reprocessing secondary to worry. Treatment consisted of training in self-monitoring, applied relaxation, cognitive therapy, behavioral approach tasks, and exposure to worry and worry cues. Therapy sessions consisted of 6 weekly 2-hour sessions, followed by 2 1-hour sessions, for a total of 14 hours of CBT for each group.

MI Pretreatment—Participants in the MI pretreatment condition (MI-CBT) received 4 individual 50-minute weekly MI sessions prior to participating in CBT. The MI followed the principles and methods described by Miller and Rollnick (2002), but with a focus on ambivalence and motivation to change worry and related problems. Treatment followed the manual developed by Westra and Dozois (2003) adapting MI for the treatment of anxiety.

Procedure

Observed resistance was coded for the entire first session of CBT. Homework compliance ratings, both client and therapist, were completed at sessions 2, 4, 6, and 8 of CBT. Average homework compliance scores for both client and therapist were calculated by taking the average of these ratings. The two self-report measures of motivation (CQ & CMOTS) were administered at baseline and after the pretreatment period (i.e., after MI or after 4-week wait). For each of these scales, the score immediately preceding the start of CBT was utilized in the data analysis (i.e., post the waiting period). The PSWQ was administered at baseline, after the pre-treatment period, post-CBT and at one-year post-treatment. The ADIS IV was administered at baseline and at one-year follow-up. Further details on the treatments and training can be obtained from the published outcome report of the larger clinical trial (Westra et al., 2009).

Results

Client demographics and means and standard deviations for all measures are presented in Table 1. The sample was between the ages of 18 and 66, not engaged in concurrent psychotherapy, ethnically diverse, generally well-educated, had a chronic worry problem, and 63% had at least 1 other clinically significant diagnosis beyond GAD. Correlations between the various measures evaluated in the present study are presented in Table 2. No significant correlations were observed among the measures of motivation. Both observed early resistance and CQ scores, but not CMOTS scores, were associated with homework compliance and worry reduction post-treatment; with the magnitude of correlations being higher with observed early resistance compared with self-reported motivation on the CQ.

Predicting Homework Compliance in CBT

Multiple regression was used to examine the ability of each motivation measure independently to predict subsequent homework compliance in CBT (client and therapist

rated). In these analyses pre-treatment worry severity was included as a covariate to control for any influence of initial severity on homework compliance. As depicted in Table 3, higher observed early resistance was a consistent and substantive predictor of subsequent lower client homework compliance as rated by both therapists and clients, accounting for 36% and 39% of the variance, respectively. Higher scores on the CQ were also predictive of higher levels of client rated homework compliance but not therapist rated homework compliance. However, observed early resistance accounted for at least three times the amount of variance in client rated homework compliance compared with CQ scores (11%). Both CMOTS indices failed to significantly predict homework compliance. Similarly, when the 6 individual subscales of the CMOTS were entered simultaneously in the regression equation predicting client and then therapist rated homework, no subscale met the criterion for statistical significance of $p<.008$ (alpha=.05/6).

In addition, all measures of motivation were included simultaneously in regressions predicting homework compliance in order to examine the contribution of each measure beyond the others, with client baseline severity as a covariate[2]. Here, only lower levels of observed resistance in session 1 was significantly predictive of higher therapist rated, $t = -3.94$, $p<.001$, beta = −.58, and client rated, $t = -4.16$, $p<.001$, beta = −.59, homework compliance. Collectively, self-report measures of motivation accounted for 8% and 12% of the variance in therapist and client rated homework compliance, respectively. And observed resistance accounted for 30% and 31% of the variance beyond the other measures of motivation in therapist rated and client rated homework compliance, respectively.

Predicting Worry Reduction

Results of hierarchical multiple regressions predicting post-treatment worry from each measure of motivation are presented in Table 4. In each of these analyses, pre-CBT PSWQ scores (after pre-treatment) were entered in step 1, with scores on each measure of motivation entered at step 2. Higher observed early resistance was a significant and substantive predictor of both poorer post-CBT and one-year post-treatment worry reduction, accounting for 32% and 23% of the variance in worry outcome respectively. Higher scores on the CQ also predicted greater worry reduction at both time points, accounting for 16-17% of the variance in outcome. Again, both CMOTS indices, as well as individual CMOTS subscales, were unrelated to outcome.

When all four measures were entered simultaneously in linear regressions predicting worry outcomes, controlling for baseline client worry severity[2], only observed resistance at session 1 was significantly predictive of post-treatment worry scores, $t = 3.67$, $p=.002$, beta = .48. Collectively, the self-report measures of motivation accounted for 22% of the variance in post-treatment worry, while resistance accounted for 21% of the variance beyond the self-report measures. In terms of worry scores one-year post-treatment, both lower early resistance, $t = 1.91$, $p=.068$, beta=.33 and higher CQ scores, $t = 1.81$, $p=.083$, beta = −.34 were significantly predictive, albeit at a marginal level of significance. Collectively, the self-report measures accounted for 23% of the variance in worry scores at one-year follow-up, while resistance accounted for an additional 8% of the variance beyond the self-report scales.

GAD diagnostic status at one-year post-treatment

The measures of motivation were also compared in terms of their ability to differentiate those who continued to retain a diagnosis of GAD at one-year from those who no longer met diagnostic criteria for GAD. Table 5 presents the between group means, standard deviations

[2]This analysis should be considered exploratory given the limited sample size relative to the number of predictor variables.

and the results of t-tests. Those who continued to retain a diagnosis of GAD one-year post-treatment were observed to have significantly higher levels of resistance in session one of CBT, compared to those who no longer met criteria for GAD. The effect size was moderate at *d*=.71 (CI: −.02 to 1.41). The CQ also differentiated client GAD diagnostic status at one-year post-treatment at a marginal level of significance, *d*=.68 (CI: −.05 to 1.38). Neither CMOTS index or individual CMOTS subscales significantly differentiated client GAD diagnostic status.

Impact of MI

For these analyses only resistance coding for those of high worry severity in the MI group was available (N=19) and thus this group was compared to those of high worry severity in the NPT-CBT group (N=18). The means, standard deviations, and between group tests (MI pretreatment versus no pretreatment) are presented in Table 6. For observed early resistance, a between groups t-test revealed a highly significant effect, with those having received MI prior to CBT demonstrating substantially less resistance in CBT session 1 compared with those who did not receive a pretreatment. The effect size was quite large at *d*=1.45 (CI: 0.67 to 2.15). Using repeated measures ANOVA, there was no significant interaction of time (baseline, post-pretreatment) and treatment group on CQ scores. A marginally significant time by treatment group effect was obtained for the CMOTS index of more self-determined motivation, with a moderate effect size of *d*=.73 (CI: .05 to 1.38). Those who received MI reported greater increases in more self-determined motivation compared to those who received no pretreatment. No significant time by group effect was observed for the CMOTS index of less self-determined motivation. However, when the individual subscales of the CMOTS were examined, there were no significant time by treatment group interactions for any of the subscale; although change in intrinsic motivation approached significance, p=. 094.

Discussion

Of the three measures of motivation evaluated in the present study (observed early resistance and two self-report measures: the Change Questionnaire, CQ and the Client Motivation for Therapy Scale, CMOTS), higher observed resistance in CBT session 1 was the most consistent and strongest predictor of both proximal (lower homework compliance) and distal (less worry reduction post-CBT and at one-year follow-up) outcomes in CBT. Higher levels of early resistance also significantly distinguished both those who continued to meet diagnostic criteria for GAD one-year post-treatment compared to those who did not, as well as those who did not receive a pretreatment prior to CBT compared to those who received MI.

In contrast, the two self-report measures of motivation were inconsistently related to homework compliance, short and long term outcome, and failed to consistently differentiate those who received MI prior to CBT from those who did not. Moreover, in the cases where one or the other self-report measure did show significant predictive capacity on an index, observed resistance had at least double the predictive capacity compared to self-report. In fact, the variance accounted for by early resistance was consistently impressive, accounting for between 36% to 39% of the variance in homework compliance, and between 23% to 32% of the variance in outcome. Moreover, when measures were examined simultaneously to directly compare their predictive capacity, early observed resistance consistently accounted for substantial additional variance in homework compliance and worry outcomes beyond self-report.

These findings underscore the importance of clinician sensitivity to opposition to change and treatment in actual therapy sessions. Even though resistance was quite rare relative to

co-operation (the overall mean for resistance was 0.26 on a 0 to 3 point scale), even these rare instances of resistance early in therapy (CBT session 1) were capable of strongly predicting subsequent client engagement in therapy and outcomes up to one-year post-treatment. Clearly not all moments in a session are of equal significance and a number of investigators have suggested that the ability to detect and effectively mange resistance is a key clinical skill (Binder & Strupp, 1997; Burns & Auerbach, 1996; Safran & Muran, 1996; Westra & Dozois, 2008; Westra, in press). These conclusions converge with other work on the predictive significance of early resistance (e.g., Aviram et al., 2010; Jungbluth & Shirk, 2009; Shirk & Jungbluth, 2010). For example, using ratings of motivation from the initial assessment interview, Keithly, Samples and Strupp, (1980) noted that "within one-half hour, raters had selected those patients who turned out to be the highest changers after 25 sessions of therapy". And research in this area is highly convergent in underscoring the importance of resistance as a very important process marker, that does not naturally dissipate over time in CBT (Aviram et al., 2010) and that strongly indicates the use of supportive compared to directive methods (Ahmed, Westra, & Constantino, 2010; Beutler et al., in press; Westra, in press).

Early resistance also substantially differentiated those who received MI prior to CBT compared to those who received no pretreatment (CBT alone), with a large between group effect. These findings strongly suggest that observed resistance in actual therapy sessions is a very sensitive index of the impact of having received MI, with those receiving MI exhibiting substantially higher levels of co-operation early in CBT than those who did not receive MI. Thus, observational measures of resistance should be included in future research combining or integrating MI with other treatments. For example, lower observed resistance in subsequent treatment might be considered an outcome of the proficient use of MI and resistance could also be investigated as a mediator of outcomes when adding MI to CBT (Aviram et al., 2010).

Of the self-report measures, the newly developed CQ, based on psycholinguistic analyses of client motivational speech, showed significant promise in this study as a self-report measure of motivation for changing anxiety. Higher levels of motivation on the CQ were associated with significantly higher levels of client rated homework compliance and better worry reduction at post-treatment and even at one-year follow-up. While very prone to ceiling effects (Miller & Johnson, 2008), there was still sufficient variability in scores to predict proximal and distal therapy outcomes. These findings are consistent with studies indicating that patients' in-session articulations of intent to change during treatment for substance abuse predict positive outcomes (Aharonovich et al., 2008; Amrhein et al., 2003; Moyers et al., 2007). The findings of the present study suggest that such statements can be captured to some degree on self-report measures as well, and that a highly face-valid direct self-report questionnaire can fare as well and possibly better than indirect or complex self-report measures of motivation (Miller & Johnson, 2008).

In terms of limitations, the present sample included only those with GAD. Future studies should examine the predictive capacity of observed resistance relative to other measures in other anxiety populations. Moreover, a number of other self-report measures of motivation for changing anxiety are available (e.g., The University of Rhode Island Change Assessment, URICA, McConnaughy, Prochaska & Velicer, 1983; The Nijmegen Motivation List 2, Keijsers et al., 1999) but were not used in the present study secondary to previous research suggesting inconsistent and weak relationships with CBT outcomes. It is unclear how well observed resistance would compare to these other measures in terms of predictive capacity. In addition, therapist responses are highly influential in amplifying or diminishing the level of client resistance (Miller et al., 1993; Moyers & Rollnick, 2002). Therapist influences on client resistance in this study are unknown and therefore the extent to which

early resistance represents a client characteristic is unclear. Finally, it is possible that the resistance measure is reflective of constructs other than client motivation, such as client level of reactance (or the tendency to behave oppositionally in response to threats to personal freedoms; Beutler et al., in press). Future studies should also investigate the relationship of early resistance to other early treatment variables capable of predicting outcome such as outcome expectations or treatment credibility.

In short, early observations of resistance, or opposition to treatment and change, expressed interpersonally in the actual session were found to be consistent and powerful predictors of subsequent client engagement and outcomes in CBT for anxiety, even long-term outcomes. Findings have both clinical and research implications. They not only support the importance of developing clinical sensitivity to detecting and effectively managing resistance but also support the continued identification and investigation of important process variables in the context of CBT. Such research would help elucidate how key client variables influence process and outcome in CBT, serve as a platform for investigating more and less effective therapist responses to resistance within CBT, and more generally assist in explicating the underlying interpersonal process characterizing more and less effective CBT. While the findings for the CQ (a self-report measure of motivation based on motivational language) show promise, in general, the variance accounted for by observations of in-session resistance was much more substantive and any self-report measure of motivation may be sensitive to response or self-presentation bias. This may be particularly the case in the domains of highly aversive conditions like anxiety and depression. In the eating disorders domain for example, self-report measures of motivation have been found to be consistently related to treatment outcome and recovery (e.g., Geller, Drab-Hudson, Whisenhunt, & Srikameswaran, 2004; McHugh, 2007). It may be much more acceptable to indicate that dieting and losing weight are desirable, than to report that inherently aversive affective states such as anxiety and depression can have benefits. These limits notwithstanding, observational coding is very time consuming and having other brief measures of motivation is valuable for research and clinical practice. The CQ can even be adapted to a 3-item version amenable for administration in clinical practice (Miller & Johnson, 2008). Such self-report measures require continued development and evaluation in the domain of anxiety but could ultimately supplement observational measures of in-session resistance as indicators of client motivation.

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Table 1

Sample Characteristics

Penn State Worry Quest.	
Baseline	M=66.63, SD=8.34
Pre-CBT	M=66.18, SD=9.02
Post-CBT	M=42.62, SD=15.46
1-year post CBT	M=42.76, SD=16.59
Homework Compliance	
Therapist Rated	M=4.22, SD=0.76
Client Rated	M=3.95, SD=0.84
Observed Resistance	
CBT Session 1	M=0.26, SD=0.13
Change Questionnaire	M=103.63, SD=10.56
CMOTS:	
More self-determined	M=22.39, SD=2.89
Less self-determined	M=10.59, SD=4.43
Gender	27 Female, 11 Male
Age	M=40.89, SD=11.73
Ethnicity	22 Caucasian 9Asian 4 Hispanic 3 African Canadian
Marital status	19 Married/cohabitating 14 Never Married 5 Divorced/Widowed/Separated
Employment status	8 unemployed/not in school 30 employed/in school
Highest level of education	3 elementary 10 high school 21 post-secondary 4 graduate school
Average family income	13 less than $40,000 15 $40-80,000 10 greater than $80,000
Worry chronicity	M=20 years (Range 0.6 – 57.5)
Axis I Comorbidity	12 Anxiety Disorder

	14 Depression/Dysthymia

Table 2

Correlations between measures

	CQ	CMOTS: More SDM	CMOTS: Less SDM	PSWQ Pre	PSWQ Post	PSWQ 1-yr	Therapist HW	Client HW
1	−.29 p=.083	−.08 p=.654	−.02 p=.926	.11 p=.151	.57** p<.001	.52* p=.002	−.58** p<.001	−.61** p<.001
2	-----	.26 p=.121	.10 p=.570	.05 p=.788	−.40* p=.014	−.40* p=.020	.31 p=.059	.33* p=.041
3		-----	.18 p=.294	.22 p=.178	−.18 p=.281	.08 p=.658	.10 p=.536	.08 p=.630
4			-----	.20 p=.235	−.18 p=.276	−.10 p=.566	−.04 p=.797	.03 p=.860
5				-----	.13 p=.442	.31 p=.076	.17 p=.315	.16 p=.343
6					-----	.61** p<.001	−.36* p=.026	−.33* p=.045
7						-----	−.43* p=.012	−.40* p=.022
8							-----	.86** p<.001

** *Notes:* p<.001

* p<.05;

1: Observed resistance in CBT session 1, 2: Change Questionnaire (CQ), 3: Client Motivation for Therapy Scale (CMOTS): More Self-Determined Motivation (SDM), 4: Client Motivation for Therapy Scale (CMOTS): Less More Self-Determined Motivation (SDM), 5: Penn State Worry Questionnaire (PSWQ) post pretreatment; 6: PSWQ post-CBT, 7: PSWQ @ 1-year post-CBT, 8: Therapist rated homework compliance, 9: Client rated homework compliance (HW)

Table 3

Predicting Homework Compliance in CBT

Homework Compliance	Observed Resistance in CBT 1	Change Questionnaire	More Self-Determined Motivation (CMOTS)	Less Self-Determined Motivation (CMOTS)
Therapist Rated	R^2=.36 t=4.42 p<.001 Beta= −.60	R^2=.07 t=1.69 p=.100 Beta=.27	R^2=.00 t=0.02 p=.982 Beta=.00	R^2=.00 t=0.13 p=.897 Beta=.02
Client Rated	R^2=.39 t=4.71 p<.001 Beta= −.63	R^2=.11 t=2.06 p=.047 Beta=.33	R^2=.00 t=0.22 p=.826 Beta=.04	R^2=.01 t=0.61 p=.549 Beta=−.10

Table 4

Predicting Worry Reduction (PSWQ)

	Observed Resistance in CBT 1	**Change Questionnair**	**More Self-Determined Motivation (CMOTS)**	**Less Self-Determined Motivation (CMOTS)**
Post CBT	R^2=.32 t=3.99 p<.001 Beta=.56	R^2=.16 t=2.62 p=.013 Beta=−.40	R^2=.05 t=1.30 p=.201 Beta=−.22	R^2=.04 t=1.29 p=.207 Beta=−.22
1-yr post-CBT	R^2=.23 t=3.18 p=.003 Beta=.48	R^2=.17 t=2.67 p=.012 Beta=−.42	R^2=.00 t=0.14 p=.989 Beta=.00	R^2=.02 t=0.90 p=.377 Beta=−.16

Table 5

Differentiating GAD diagnostic status one-year post-treatment

	Observed Resistance in CBT 1	**Change Questionnaire**	**More Self-Determined Motivation (CMOTS)**	**Less Self-Determined Motivation (CMOTS)**
Continues to meet GAD criteria (N=13)	M= 0.33 SD=.10	M=101.15 SD=10.97	M=21.95 SD=3.30	M=9.64 SD=3.00
No longer meets GAD criteria (N=20)	M=0.24 SD=.14	M=107.60 SD=8.43	M=22.43 SD=2.90	M=11.92 SD=5.27
	t(30)=2.17 p=.038	t(31)=1.91 p=.066	t(31)=0.45 p=.660	t(31)=1.58 p=.125

Table 6

Differentiating Those who Received MI Pretreatment from Those who did not

	Observed Resistance in CBT 1	Change Questionnaire	More Self-Determined Motivation (CMOTS)	Less Self-Determined Motivation (CMOTS)
MI (N=19)	M=0.13 SD=.09	M change=0.32 SD=15.87	M change=1.64 SD=3.32	M change=0.52 SD=3.03
No MI (N=18)	M=0.30 SD=.14	M change=5.89 SD=13.74	M change=0.02 SD=3.07	M change=0.15 SD=4.18
	t(33)=4.28 p<.001	Group × Time, F(1,35)=1.02, p=.329	Group × Time, F(1,35)=3.52, p=.069	Group × Time, F(1,35)=0.33, p=.570