Development of the Treatment Attitudes Questionnaire in Bipolar Disorder

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Despite the success of pharmacotherapy in the management of bipolar disorder, as many as one-half of those in treatment discontinue their medication over time. Currently, no self-report measure is available that predicts treatment engagement in bipolar disorder. The goal of the current study was to develop a measure of awareness of symptoms and attitudes toward treatment among those with bipolar disorder. Sixty-six participants diagnosed with bipolar I disorder on the SCID completed the Treatment Attitudes Questionnaire (TAQ) and were then followed for up to 2 years to assess symptom levels. Medication data were available for 37 participants. Analyses of the TAQ were conducted to examine reliability, predictors of subscales, and how well scores predicted medication and symptom levels over time. Results indicate that previous episodes of depression, but not episodes of mania, correlated with increased scores on the Insight and the Enjoyment of Mania subscales. Scores on the Nonbiological Attributions subscale predicted lower levels of lithium as well as increased depressive symptoms over time. Although the current study includes limited measurement of treatment engagement and a small sample size, this easily administered scale may help treatment planning for those with bipolar disorder. © 2008 Wiley Periodicals, Inc. J Clin Psychol 64: 466–481, 2008.

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"I had become addicted to my high moods; I had become dependent upon their intensity, euphoria, assuredness, and their infectious ability to induce high moods and enthusiasms in other people" (Jamison, 1996).

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With the introduction of lithium treatment in the late 1960s (Baastrup & Schou, 1967), and the development of other pharmacotherapy approaches, including divalproex, carbamazepine, lamotrigine, and atypical antipsychotics, a range of effective treatments are now available (Muzina & Calabrese, 2005). Although symptoms remain a concern for some on these medications (Judd et al., 2003), evidence has accrued to suggest that mood-stabilizing medications substantially diminish symptoms as well as hospitalization rates (cf., Smith, Cornelius, Warnock, Bell, & Young, 2007). Despite this, estimates suggest that one-third to one-half of patients with bipolar disorder discontinue medication treatment over time (Basco & Rush, 1995; Svarstad, Shireman, & Sweeney, 2001). Lack of adherence to mood stabilizers has been shown to contribute to poorer course of disorder and more frequent hospitalization (Scott & Pope, 2002). Thus, a fundamental challenge in the effective care of bipolar disorder appears to be promoting medication adherence.

To date, adherence has been a fairly poorly understood phenomenon. Biologically-oriented researchers have viewed poor adherence as the result of limited awareness of symptoms, considered to be a neurobiological outcome of impaired executive function (Dixon et al., 2004; Ghaemi, Boiman, & Goodwin, 2000; Quarishi & Frangou, 2002). Evidence suggests, however, that a much broader range of illness-related and psychological characteristics must be considered. Illness characteristics, such as symptom severity (Scott & Pope, 2002) and comorbid drug and alcohol abuse (e.g., Swartz et al., 1998) have been found to be predictive of poor adherence, as have comorbid personality disorders in some (Colom et al., 2000) but not all studies (Kleindienst & Greil, 2004). Psychologically, people who reported greater awareness of and greater acceptance of their disorder were found to be more likely to comply with medications (Greenhouse, Meyer, & Johnson, 2000; Scott & Pope, 2002).

Consistent with the idea that treatment adherence may be best viewed as a psychological and developmental process, researchers have found that adherence is low early in treatment (Kleindienst & Greil, 2004; Scott & Pope, 2002). Psychotherapy studies also indicate that treatment adherence can grow over time as many people become more adherent with medications during the course of treatment (cf., Sajatovic, Davies, & Hrouda, 2004). Adherence enhancement has been a core component of group, family, and cognitive therapy approaches (Bauer & McBride, 1996; Lam et al., 2003; Miklowitz & Goldstein, 1997), and empirical evidence supports that family therapy (Miklowitz, George, Richards, Simoneau, & Suddath, 2003) and psychoeducation both improve medication levels (Colom et al., 2005; Fristad, 2006). While some authors have found moderate treatment effects on adherence from baseline to follow-up ($d = .46$; Miklowitz et al., 2000), others have obtained fairly small effect sizes (less than .10; Colom et al., 2000; Fristad, 2006). The early wave of treatment trials in this field, then, would suggest that adherence is a fairly difficult treatment target.

In sum, adherence is a major predictor of outcome and an important treatment target. Thus, understanding the psychological factors associated with adherence is a cardinal issue. Many researchers have focused on the Health Belief Model (HBM; Rosenstock, 1974) to understand adherence in physical disorders. In the HBM, perceived benefits and necessity are weighed against undesirable factors associated with the treatment. These factors may include stigma, disliking side effects, or financial burden. According to the HBM, adherence is more likely to occur when the benefits of treatment and need for treatment outweigh the undesirable aspects. Although it has been found to be predictive of adherence in some studies of the mentally ill (Perkins et al., 2006), research on the applicability of the HBM to bipolar

disorder has produced mixed results. That is, scales based on the HBM have correlated only modestly with treatment adherence in bipolar disorder (Cohen, Parikh, & Kennedy, 2000; Connelly, Davenport, & Nurnberger, 1982; Scott, 2002).

Another widely researched model of adherence, the self-regulatory model (SRM), was formulated to help explain treatment adherence among the chronically ill (Leventhal, Meyer, & Nerenz, 1980). The SRM, also known as the common sense model, perceives taking medication as a response to the interpretation of threat for the individual, including physical symptoms and recognition of disease. A coping procedure (e.g., taking medication) is selected in accordance with beliefs about the causes, duration, consequences, personal identification, and control of the illness.

In both models, adhering to medication is viewed as a rational cognitive decision by the patient, wherein risks and benefits of treatment are consciously assessed. Several assessment measures, including the Beliefs about Medicines Questionnaire (BMQ; Horne, Weinman, & Hankins, 1999), the Drug Attitude Inventory (DAI; Hogan, Awad, & Eastwood, 1983) and the Rating of Medication Influences scale (ROMI; Weiden et al., 1994) have been developed to help researchers and practitioners understand the myriad reasons for nonadherence, based primarily on the aforementioned models.

Despite a burgeoning literature on adherence in regard to other disorders, literature on adherence in bipolar disorder has been dominated by four scales and structured interviews: The Illness Concepts Scale (ICS; Linden, Nather, & Wilms, 1988), the Lithium Attitudes Questionnaire (LAQ; Harvey, 1991), the Scale to Assess Unawareness of Mental Disorder (SUMD; Varga, Magnusson, Flekkoy, Ronneberg, & Opjordsmoen, 2006), and the Schedule for Assessment of Insight—Expanded Version (SAI-E; Kemp & David, 1990). The Illness Concepts Scale (ICS) was initially developed to assess how patients with schizophrenia understood their illness. The ICS measures the following dimensions: trust in medicines and the treating physician, guilt, locus of control, negative expectations of treatment, susceptibility to episodes, and idiosyncratic assumptions (e.g., "Natural healing is always better than drug treatment"). Kleindienst and Greil (2004) used the ICS to assess patients with bipolar disorder. The authors found that trust in medication and the treating physician, as well as an absence of negative expectations of treatment, predicted a longer time to treatment discontinuation in patients treated with lithium, but not carbamazepine. Another survey, the Lithium Attitudes Questionnaire (LAQ), was developed to assess attitudes toward lithium prophylaxis (Harvey, 1991). The LAQ covers attitudes potentially associated with nonadherence to lithium. Side-effects, subcultural attitudes, and difficulty maintaining pill-taking routines were shown to be correlated with negative attitudes toward lithium as assessed by the LAQ.

Both the ICS and the LAQ were adapted from research on schizophrenia. Thus, certain phenomena specific to bipolar disorder are neglected in these questionnaires. For example, research has shown that adherence appears to be lower among people who enjoy positive aspects of mania, such as grandiosity and elevated mood (Kleindienst & Greil, 2004).

Beyond conceptual gaps in the content covered, no self-report assessment measures have been found to predict treatment success over time, despite cross-sectional correlations (Ghaemi et al., 2000). Indeed, only one interview-based measure, the SAI-E, has been found to correlate with treatment adherence cross-sectionally and to predict treatment adherence at 1-year follow-up among people with bipolar disorder (Yen et al., 2005). We can not identify a single self-report measure of treatment attitudes that has been predictive of treatment engagement and

symptoms within bipolar disorder. Self-report measures can be more easily administered and so might provide opportunities for routine assessment of risk for medication nonadherence.

Hence, the goal of this study was to develop a measure of treatment attitudes that would draw from influential models of psychological variables involved in adherence across disorders, but also would assess unique characteristics potentially involved in adhererence within bipolar disorder. We also wanted to test whether such a measure could predict treatment engagement and symptoms over time, as such predictive validity has been difficult to achieve with previous measures. We provide preliminary data on this measure by examining how the scale predicts adherence, as well as how it relates to variables that have been previously found to predict greater insight into bipolar disorder.

Method

Participants

Data presented in the current study were obtained from a larger longitudinal sample. Participants were recruited from the South Florida community through physician referrals in clinics and hospitals, through support groups and through public advertising. Previous reports from this study have addressed social support, life events, cognitive styles, and self-esteem (Johnson et al., in press; Johnson et al., 2000; Meyer, Beevers, & Johnson, 2004). The Structured Clinical Interview for DSM-III (SCID; Spitzer, Williams, Gibbon, & First, 1990) was administered to a pool of potential participants aged 18 and older to select those with a diagnosis of bipolar I disorder. Exclusion criteria included substance abuse or dependence in the past year, cognitive or linguistic barriers to completion of self-report measures, and neurological disorder.

The current sample includes 66 participants (51% females and 28% minorities). The mean age was 43.72 ($SD = 11.04$) years. Only 20% were married or cohabitating. Consistent with most samples of bipolar disorder in the community (e.g., Hirschfeld, Lewis, & Vornik, 2003), only 27% were employed full-time and 12% were employed part-time at study intake. Number of years of education ranged from 9 to 19 years ($M = 14.54$, $SD = 2.48$). All but three participants met criteria for a current mood episode at study entry. Among those who were experiencing a mood episode, 44% met criteria for depression and 32% met criteria for mania. The remaining participants reported being in either a mixed episode or were rapid-cycling. Participants reported a mean of 12.82 lifetime manic episodes ($SD = 15.82$), and a mean of 14.53 lifetime major depressive episodes ($SD = 16.42$).

Design and Procedure

Procedures for this study were reviewed by the Institutional Review Board at the University of Miami. All participants completed written informed consent. During a baseline interview, they completed a diagnostic interview. The TAQ was given in the first month of the study, unless participants were experiencing symptoms that were too severe to allow for adequate completion, such as depression or mania symptom severity scores in the clinical range. In such cases, administration was delayed. Fifty-five percent of participants completed the TAQ at baseline, another 26% completed the TAQ at a 2-month follow-up, and others were delayed by several months. To assess test-retest reliability of the TAQ, 33 individuals were re-administered the TAQ 12 months after the first administration.

Follow-up interviews were conducted monthly for 2 years after study enrollment to assess symptoms and medication levels. Depending on participant preference, follow-up interviews were conducted either in person or by telephone. Gathering symptom severity data via telephone has been shown to be both highly reliable and valid (Simon, Revicki, & VonKorff, 1993). In general, attrition rates were comparable or better than that of other naturalistic studies of bipolar disorder (for details regarding study attrition, see Johnson, Winett, Meyer, Greenhouse, & Miller, 1999). On average, participants in this study completed 26.86 months of follow-up. That is, 1773 symptom interviews were conducted for this study. Although all participants completed at least two months of follow-up after completing the TAQ, only 65% were followed for at least 2 years.

Measures

Training. All interviewers were trained by S. Johnson prior to conducting any diagnostic or symptom severity interviews. Before the first study interview was conducted, interrater reliability was established. Throughout the study, tapes of interviews were routinely reviewed in order to ensure reliability, and regular meetings were held to review interviews.

Treatment Attitudes Questionnaire. To develop items, the literature on treatment adherence was first reviewed. Items were drawn from scales designed to measure adherence in other disorders (Harvey, 1991; Linden et al., 1988), as well as from research-based predictors of nonadherence. To supplement these items, open-ended interviews were conducted. Twenty persons with bipolar disorder were recruited from local community support groups for mood disorders. They were interviewed about their course of treatment and current level of treatment, and they were asked to comment on thoughts and experiences that had made it easier and harder to accept the need for treatment. Statements concerning treatment and bipolar disorder were extracted from transcripts of these interviews. Then, two psychologists and two psychology interns, all of whom were employed full-time in a center for mood disorders, were asked to review items, edit them for clarity, and add items that they felt might help predict treatment adherence. These judges also helped assign items to subscales on a rational basis. Items were written to capture the following content: recognition of illness and need for medications (Insight); problems consequent to the illness and treatment, such as stigma, medication side effects, etc. (Negative Attitudes); enjoyment of positive aspects of mania (Enjoyment of Mania); and attributions for the illness that are not biological (Nonbiological Attributions). The total scale, consisting of 74 items, was then administered to 32 inpatients and outpatients who met DSM criteria for bipolar disorder according to the Structured Clinical Interview for DSM-III (SCID; Spitzer et al., 1992). Participants were asked to rate how well each item fit them on a scale from 1 "*Not at all*" to 5 "*Definitely*." They were also asked to indicate if they felt any items were unclear. Any items rated as unclear were then eliminated, as were items with no variability. A trimmed item set of 62 items was administered within this study.

Diagnosis. The SCID was used to confirm a diagnosis of bipolar I disorder. Although the DSM-III-R version was used, criteria for mania and bipolar I disorder are entirely comparable for DSM-IV. Participants whose mania was due to a general medical condition or whose manic episodes were induced by antidepressant medication were excluded from the study. Dr. Johnson and two clinical

psychology doctoral students completed the SCID interviews for this study. High interrater reliability for bipolar disorder ($\kappa = .84$) has been reported in previous research (Williams et al., 1992). To assess interrater reliability within this study, the three interviewers rated 10 randomly selected audiotapes. Intra-class correlations for specific symptoms of mania were .92, with absolute agreement for the presence or absence of a manic diagnosis. During the SCID, interviews gathered number of previous episodes that met diagnostic criteria, as well as number of hospitalizations for both manic and depressive episodes.

Symptom Severity. The Modified Hamilton Rating Scale for Depression (MHRSD) was used to measure symptom severity (Miller, Bishop, Norman, & Maddever, 1985). Standardized anchors and probes are used in the modified version to facilitate use by paraprofessional interviewers. The MHRSD achieves an intraclass correlation of .84 with the original HRSD. The MHRSD is sensitive to small changes in depression severity (cf., Miller, Uebelacker, Keitner, Ryan, & Solomon, 2004) and has demonstrated high interrater reliability in our interviewers (intra-class correlation = .93 for three raters evaluating 12 randomly selected audiotapes, calculated using methods described in Shrout & Fleiss, 1979). In addition, internal consistency was high ($\alpha = .94$, $N = 66$).

The Bech-Rafaelsen Mania Scale (BRMS; Bech, Bolwig, Kramp, & Rafaelsen, 1979) was used to assess symptom severity of mania. Symptoms such as flight of thoughts, elevated mood, decreased need for sleep, and heightened sexual interest are measured using this 11-item semi-structured interview, with each item rated on a 5-point scale. Extensive evidence suggests that the scale obtains high interrater reliability and is sensitive to both changes in manic symptoms after one week and group differences in medication versus placebo (Bech, 2002). Behavioral anchors for each scale point, as well as a standardized interview format, were used to increase reliability within our team. As above, three raters evaluated 12 randomly selected audiotapes, and a high intra-class correlation coefficient was obtained ($\alpha = .92$), as well as high internal consistency ($\alpha = .94$, $N = 66$).

Both the MHRSD and BRMS were used to identify the most severe week of symptoms in the past month. Ratings were averaged across the months of follow-up for analyses. Two factors were found using a principal components factor analysis of the first BRMS and MHRSD ratings for each participant: a depression factor consisting of all MHRSD items and a mania factor consisting of all BRMS items.

At baseline, BRMS scores ranged from 0 to 40, with a mean of 9.62 ($SD = 10.67$). MHRSD scores ranged from 0 to 39 with a mean of 13.47 ($SD = 8.75$). BRMS scores aggregated over follow-up ranged from 0 to 31, with a mean of 6.88 ($SD = 5.53$), and MHRSD scores across follow-up ranged from 1.48 to 29.44, with a mean of 11.02 ($SD = 5.88$).

Somatotherapy Index. Adequacy of pharmacological treatment was assessed using the Somatotherapy Index (Bauer et al., 1997). The Somatotherapy Index is a 6-point scale based on the treatment adequacy scale used in the NIMH Program on the Psychobiology of Depression Clinical Studies Project (Keller et al., 1986). The scale is specifically designed to assess the treatment adequacy of bipolar disorder. Study participants provided information about dosage, adherence, and blood serum levels for mood-stabilizing, antidepressant, antipsychotic, anxiolytic, and other psychotropic medications. Medical records were requested to provide confirmation of levels. Scoring of the Somatotherapy Index is based on a detailed set of tables (for example, level 3 is defined as "200–299 mg of imipramine hydrochloride or

equivalent for 4 consecutive weeks, 4–7 ECTs, or 600–899 mg of lithium carbonate for 4 consecutive weeks''). Our team obtained high interrater reliability. Lower ratings have been found to predict higher symptom severity and suicidality (Johnson, Ruggero, & Carver, 2005).

Unfortunately, many physicians did not return medical records that were requested. As a result of difficulty obtaining records to verify reports, somatotherapy coding was only available for 37 persons in the current study. The current sample varied in their treatment adequacy. Only 33% were receiving the highest rating of adequacy for medication levels, and 8% reported no engagement in medical treatment. Few participants were treated consistently across follow-up with antidepressants ($n = 17$), benzodiazepines ($n = 1$), neuroleptic medications ($n = 12$), or antiseizure medications ($n = 5$). Accordingly, levels of these four medication classes were not analyzed. Rather, analyses focused on the adequacy of overall pharmacological treatment and of lithium levels. Across the follow-up period, the mean level of pharmacological adequacy was 2.21 ($SD = 1.40$, range 0 to 5), and the mean level of lithium adequacy was .86 ($SD = 1.22$, range 0 to 4).

Results

Preliminary Analyses

Before computing an aggregate index of symptoms and medications across the follow-up period, we examined whether number of follow-up assessments conducted after the TAQ administration was correlated with outcome measures of the levels of symptoms or medications. Number of months of follow-up was unrelated to the pharmacological adequacy (Somatotherapy Index), $r(36) = -.01$, follow-up MHRSD scores, $r(65) = .00$, or BRMS scores, $r(65) = -.15$. For longitudinal analyses, measurements after the TAQ were aggregated into composite mean follow-up scores of BRMS levels, MHRSD levels, Somatotherapy Adequacy, and Somototherapy Lithium.

Descriptive and Psychometric Analyses

Of the 62 items tested, 9 items correlated poorly with subscales. One of these appeared more relevant to history than to insight (''I have needed to be in the hospital in the past''). The other 8 items were either vaguely written or contained two clauses, semantic issues that likely contributed to the poor performance (''Other people say I'm sick, but I'm not so sure''; ''There is nothing wrong with me''; ''The medications work well for me''; ''Most people I know would be in favor of my taking medications''; ''I can imagine a number of circumstances in which I would stop taking my medication before consulting my physician''; ''It is definitely worth taking medication despite its side-effects''; ''I would find it perfectly acceptable to take medications now and then, whenever I feel a need to''; ''My friends enjoy my company more when I'm laughing''). Another 6 items demonstrated very little variability (''I could have prevented this situation''; ''I have accepted this illness as part of my identity''; ''No one can understand my illness better than I can''; ''Mood swings have created arguments or family problems for me''; ''I have had problems with work or school because of mood changes''; ''I worry about possible side-effects from my medications, even when I am feeling well'').

All 8 items regarding external attributions for illness (External Attributions) did not cohere, were not correlated with symptoms or treatment, and were noted as

confusing by some participants. The items from this subscale were omitted. After these psychometric analyses, 39 items remained.

Examination of correlations suggested significant overlap of some scales. Upon consideration, items on these subscales demonstrated significant conceptual overlap as well. Insight and Need for Medications were robustly correlated, $r(65) = .76$, $p < .01$. These items were combined into a subscale of Insight (recognition of illness and need for medications). Subscales to assess Disliking Medications and Stigma were also significantly correlated, $r(65) = .60$, $p < .01$, and so these items were combined into a subscale of Negative Attitudes (problems consequent to the illness and treatment).

Then, three independent raters with clinical research experience in bipolar disorder provided a rating of each item's fit with the four subscales of Insight, Negative Attitudes, Enjoyment of Mania, and Nonbiological Attributions. Only those items receiving 100 percent agreement on scale placement were retained. Through this process, the following items were excluded from analyses: ''Family members or friends will not be able to accept me because of my illness,'' ''I can find the real cause of my illness in myself,'' ''I can manage my symptoms without doctor visits,'' ''I sometimes try to forget I have been ill by taking a break from medications,'' ''I will be fine if I can get enough sleep and avoid overwork,'' ''Taking medication exactly as prescribed fits in very easily with my daily routine,'' and ''The doctors don't understand me and my problems.'' After these deletions, two items demonstrated poor correlations with subscale totals and were eliminated: ''I cannot accept seeing myself as sick'' and ''I can manage my medications without doctor's visits.'' Following these deletions, the final scale included 25 items that were used for all subsequent analyses. All items demonstrated corrected item-total correlations with their assigned subscale that were larger than those with other subscale totals.

Table 1 shows the descriptive statistics for each subscale. Alpha coefficients for the subscales were adequate, and most subscales demonstrated adequate test-retest reliability. Nonbiological Attributions, however, demonstrated poor test-retest reliability, suggesting a high degree of change in responses over time. These changes did not shift in a systematically lower or higher direction; *t*-tests comparing the mean level of subscales at time 1 versus time 2 were not significant for any of the subscales. Most people in this sample endorsed high scores on the Insight subscale. Most subscales were relatively independent of each other. Those who reported higher scores on Negative Attitudes tended to report higher scores on Enjoyment of Mania, $r(66) = .34$, $p < .01$. All other correlations between subscales were nonsignificant and small (r's $< .21$)

Next, correlations with potential confounds were examined. Correlations were calculated to examine whether TAQ subscales correlated with number of months of follow-up completed after the TAQ. Analyses suggested that attrition was related to TAQ scores; Nonbiological Attributions predicted fewer months of study participation, $r(65) = -.35$, $p < .01$. Gender and years of education were unrelated to subscale endorsement. Age was also unrelated to most subscales, absolute r's $< .15$, with the exception of lower scores on the Enjoyment of Mania among older participants, $r(65) = -.25$, $p < .05$.

Correlates of TAQ Subscales with Symptoms

To determine whether treatment attitudes demonstrated expected relationships with previous and current symptoms, we examined how TAQ subscales correlated with

Table 1
Descriptive Statistics and Reliability Estimates for the Treatment Attitudes Questionnaire (n = 66 Except for Test-Retest Reliability n = 33)

Scale	Minimum	Maximum	Mean	SD	Alpha	Test-retest reliability	Corrected item correlation with subscale total
Insight	2.22	5.00	4.41	.74	.82	.80***	
I have mood (depression, nerve, or worry) problems							.49
I need to be treated with medications for mood problems (depression, nerves, or worries)							.71
I am ill and need treatment							.48
I have had mood (depression, nerve, worry) problems in the past							.24
I might have mood (depression, nerve, worry) problems again							.33
I will need treatment to prevent a relapse in the future							.60
I need to take medications for mood problems							.66
I consider that medication is at present necessary for my personal well-being							.66
I rely on my medications and if they were stopped for some reason I would be concerned							.0
Negative attitudes	1.20	5.00	3.43	.92	.89	.82***	
It is a hassle to take medications							.60
Side effects of medication are unbearable							.65
I cannot accept being dependent on drugs to control my moods							.66
I don't like the way medications change my mood							.75
The medications will deaden my personality							.61
Medications will rob me of my "bubbliness"							.71
I don't like the idea of medications controlling my mood							.70
When people say I have bipolar disorder, I worry they are saying I'm crazy							.45
I'm bothered by the idea of having a chronic illness							.55
Enjoyment of mania	1.00	5.00	2.13	1.24	.83	.69***	
When I'm high (manic) I can achieve more							.71
When I'm high (manic) I'm more creative							.71
Nonbiological attributions	1.80	5.00	3.81	.92	.72	.46**	
I got sick because of problems in my own personality							.49
My episode was my own fault							.51
I got sick because I was expecting too much of my self, my goals were unrealistic							.48
I got sick because things were going so badly at home							.48
My illness happened because of the way I was brought up							.42

**$p < .01$; ***$p < .001$.

number of lifetime manic and depressive episodes and current symptoms as measured with the MHRSD and BRMS. To assess whether the TAQ predicted *change* in future symptoms, partial correlations were conducted, controlling for baseline symptoms of depression and mania (see Table 2).

Table 2
Correlations of Treatment Attitudes Subscales with Illness History, Current Symptoms, and Follow-up Symptoms (N = 66; Pearson Correlations for MHRSD, Number of Depressions, and Mania, and BRMS; Partial Correlation Coefficients for MHRSD Change and BRMS Change)

	MHRSD	MHRSD change[a]	Number of depressions	BRMS	BRMS change[b]	Number of manias
Insight	.23	.13	.35**	.03	.07	.17
Enjoyment of mania	.15	.04	.25*	−.16	.11	.07
Negative attitudes	.39**	.29	.15	.16	.18	−.02
Nonbiological attributions	.38**	.37**	−.12	−.03	.00	.10

Note. MHRSD = Modified Hamilton Rating Scale for Depression; BRMS = Bech-Rafaelsen Mania Scale.
[a]Follow-up controlling for baseline MHRSD.
[b]Follow-up controlling for baseline BRMS.
*$p < .05$; **$p < 0.01$ level.

Treatment attitudes were unrelated to history of mania, and they did not predict changes in mania over time. In regard to depression, people who reported more previous episodes of depression were likely to obtain higher scores on the Insight subscale but also obtained higher scores on the Enjoyment of Mania subscale. On the other hand, those with current depression endorsed higher scores on the Negative Attitudes and Nonbiological Attributions subscales. Even after controlling for initial depression, higher endorsement of the Nonbiological Attributions subscale predicted increases in depression over time.

To verify that the relationship between Nonbiological Attributions scores and follow-up depression was not an artifact of attrition, we computed two additional analyses. First, we conducted a partial correlation of Nonbiological Attributions with follow-up depression, controlling for baseline depression and number of months of follow-up. Findings were comparable, partial $r(63) = .34$, $p < .01$. Second, we examined the correlation of Nonbiological Attributions scores with follow-up depression (MHRSD scores) over a 1-year period, controlling for baseline depression. Findings were also comparable, partial $r(64) = .29$, $p < .05$.

Correlations with Treatment Involvement and Symptom Awareness

Bivariate correlations were conducted to examine how the TAQ correlated with adequacy of pharmacological and lithium levels as measured on the Somatotherapy Index across the follow-up period (see Table 3). No TAQ subscales were significantly correlated with general treatment adequacy. Rather, scores on the Nonbiological Attributions subscale correlated with significantly lower lithium scores. This relationship held when the Nonbiological Attributions subscale was used to predict lithium scores over follow-up, controlling for baseline lithium scores at the time of the TAQ administration as well as the number of months of follow-up completed, partial $r(30) = -.40$, $p < .05$.

Discussion

The Treatment Attitudes Questionnaire (TAQ) is the first self-report measure developed to assess a broad range of psychological predictors of treatment engagement in bipolar disorder. After generating items based on clinical interview and expert judgment, items were selected based on their clarity and response

Table 3
Correlations of Treatment Attitude Subscales with Pharmacological and Lithium Adequacy Levels (n = 37)

	Adequacy	Lithium
Insight	.18	−.08
Enjoyment of mania	.04	.06
Negative attitudes	−.19	−.29
Nonbiological attributions	−.18	−.43*

Note. Adequacy = adequacy of pharmacotherapy as measured by the Somatotherapy Index; Lithium = adequacy of lithium levels as measured by the Somatotherapy Index.
*$p < .05$.

variability among people with bipolar I disorder. Then, preliminary psychometric and correlational analyses were conducted in a second sample of people with bipolar I disorder who completed longitudinal assessments. Current results suggest that most subscales of the TAQ have adequate internal consistency and test-retest reliability and were not confounded with demographic characteristics. Items designed to assess external attributions for illness failed to perform adequately, though, and were not included in final analyses. The remaining subscales appeared to have adequate internal consistency and test-retest reliability, but scores on the Nonbiological Attributions subscale did demonstrate poor internal consistency and also fluctuated over time. Analyses were conducted to examine the clinical predictors of the TAQ subscales and to assess whether the TAQ subscales predicted the course of treatment and symptoms over time.

Before discussing the findings, though, it is important to note several weaknesses of this study. These include the limited measurement of treatment engagement, bias in sample attrition, and the small sample size. A larger sample size would have the particular benefit of allowing for factor analysis to refine subscales. Of concern, people who reported more biological attributions (lower scores on the Nonbiological Attributions subscale) were more likely to complete the full follow-up period. This makes sense, as one might expect persons with nonbiological beliefs to be less willing to discuss their symptoms each month. Nonetheless, it raises the concern that the follow-up sample might be biased towards people with high levels of insight. We conducted analyses to examine whether attrition was a mediator of documented effects, though, and this did not appear to be the case: Number of months of follow-up was unrelated to symptom or medication levels, and relationships of this subscale with outcomes remained significant even after controlling for number of months of follow-up or examining a 1-year follow-up period. Beyond attrition, our measure of treatment adequacy reflects what medications were recommended and then taken by patients; variability across treatment providers in their recommendations will undoubtedly add error to these correlations. One might expect that more carefully titrated medication regimens would promote adherence; in this study, we could not examine the quality of prescriptions for a person's symptoms. Future studies are needed to examine how the TAQ predicts treatment engagement under more carefully designed medication regimens such as those offered within medication trials. Current results, then, must be considered highly preliminary.

Turning to the findings, we conducted analyses to examine clinical predictors of TAQ subscales. Those with more previous episodes of depression obtained higher scores on the Insight subscale but also on the Enjoyment of Mania subscale. Those

with more severe current depressive symptoms, however, endorsed higher scores on the Negative Attitudes subscale, as well as the Nonbiological Attributions subscale. Hence, a history of depressive episodes might lead a person to recognize that they have the illness, but current depressive symptoms may lead to a negative perception of the disorder and its treatment and a tendency to perceive the illness as less biologically-based. Over time, scores on the Nonbiological Attributions subscale predicted increases in depressive symptoms.

We found it intriguing that TAQ subscales were uncorrelated with indices of previous or future manic severity. Other insight scales have shown poor ability to predict mania (Ghaemi et al., 2000). Researchers suggest that the quality of the relationship with the treatment provider does predict better success in managing mania (Strauss & Johnson, 2006). It may be that the ability to form strong alliances allows providers more ease in giving difficult feedback about manic symptoms.

Beyond analyses of symptoms, we examined whether TAQ subscales were predictive of treatment over a 2-year follow-up period for a smaller subset of 37 participants. Although no subscale scores related to overall pharmacological adequacy, higher endorsement of the Nonbiological Attributions subscale correlated with lower lithium levels as measured using the Somatotherapy Index both cross-sectionally and prospectively. Speculatively, patients who believe less in the biological bases of their symptoms may need more help in adjusting to their medications—particularly those with heavier side effects such as lithium—to ensure strong treatment involvement. Not only did scores on the Nonbiological Attributions subscale predict lower levels of lithium, but this subscale also predicted study drop-out and increased depressive symptoms over time. At first glance, these findings seem consistent with previous recommendations to help patients develop an understanding of the genetic basis of bipolar disorder (Frank, Kupfer, & Siegel, 1995), but this scale did not specifically measure beliefs in genetic mechanisms. It will be important to study how different beliefs about the sources of symptoms can help diminish self-blame while increasing hopefulness and efficacy about symptom management. Fortunately, psychoeducational programs have been found to help prevent relapse in bipolar disorder (Colom et al., 2005; Fristad, 2006), but more detailed analyses of beliefs about the illness could help refine these interventions.

In sum, current results suggest that treatment attitudes in bipolar disorder are multifaceted constructs, involving recognition of illness and the need for medication, enjoyment of positive aspects of mania, awareness of negative consequences of the disorder and the medications, and attributions for symptoms. Some attitudes that have been thought to guide symptom management and treatment involvement did not find support within this study. It remains possible that in a sample with fewer lifetime episodes of illness, other treatment attitudes, including scores on the Insight subscale, would be more predictive; our study is limited by the reliance on a sample with quite severe histories. Most important, one subscale of the TAQ, Nonbiological Attributions, predicted lithium levels and depressive symptoms over time. Given that we can identify only one interviewed-based measure of treatment attitudes that predicted lithium levels over time within bipolar disorder (Yen et al., 2005), our findings that a brief self-report scale can help predict study drop-out, medication levels, and depressive symptoms appear to have important clinical implications. That is, understanding treatment attitudes should help identify patients at risk for relapse and treatment disengagement, but should also provide windows into defining better

interventions. Certainly, there is a need for better understanding of the complex factors associated with treatment engagement within bipolar disorder.

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