Cogn Ther Res (2013) 37:1169–1178
DOI 10.1007/s10608-013-9552-1

ORIGINAL ARTICLE

Rejection Sensitivity is Associated with Quality of Life, Psychosocial Outcome, and the Course of Depression in Euthymic Patients with Bipolar I Disorder

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Published online: 6 June 2013

Abstract Rejection sensitivity has been found to predict the course of unipolar depression as well as key outcomes, but has not yet been considered within bipolar disorder. The present study investigated the effects of rejection sensitivity on outcome in bipolar disorder. Fifty-three participants diagnosed with bipolar I disorder in remission using the Structured Clinical Interview for *DSM-IV* were compared to 44 controls with no history of mood disorder. A subset of 38 bipolar participants completed follow-up interviews using standard symptom severity measures at 6 months. People with bipolar I disorder reported higher rejection sensitivity scores than did controls. Within the bipolar sample, rejection sensitivity at baseline predicted increases in depression, but not mania, over the following 6 months; heightened rejection sensitivity was also correlated with poorer quality of life, social support, and psychological well-being. Findings highlight the importance of interpersonal-cognitive factors for treating depression and improving outcome within bipolar I disorder.

Keywords Bipolar · Rejection sensitivity · Depression · Quality of life · Psychosocial outcome

Introduction

Bipolar I disorder, defined by episodes of mania, is an often incapacitating psychiatric disorder. The illness involves a lifelong vulnerability to recurrent episodes of unusual shifts in moods and energy levels which commonly incur adverse consequences, such as damage to interpersonal relationships, decreased financial income, and low rates of employment (Coryell et al. 1993; Goldberg et al. 1995). Bipolar disorder is also associated with one of the highest risks of suicide attempts among Axis I psychiatric disorders (Chen and Dilsaver 1996), with estimates of the prevalence of suicide attempts as high as 50 % (Simpson and Jamison 1999). Numerous research studies have demonstrated that patients with bipolar disorder are much more likely to commit suicide when they are in depressive states than in manic states (Balázs et al. 2006; Isometsä et al. 1994; Rihmer 2007; Valtonen et al. 2008), highlighting the importance of examining mechanisms that are linked to bipolar depression.

Although the name 'bipolar disorder' itself implies that depression and mania are opposite poles of a single continuum, this conceptualization of bipolar disorder is controversial and contested by a growing body of studies (Joffe et al. 1999; Johnson et al. 2011; McGuffin et al. 2003; Schweitzer et al. 2005). These studies suggest that depressive and manic symptoms are not opposite ends of a single dimension. Rather, depressive and manic symptoms appear to fluctuate relatively independently within bipolar disorder (Johnson et al. 2011). A large body of work also demonstrates that bipolar depression and mania are predicted by separate psychosocial risk variables (Cuellar et al. 2005). For instance, neuroticism (Heerlein et al. 1998; Lozano and Johnson 2001), negative cognitions (Johnson and Fingerhut 2004), poor social support (Johnson et al. 1999, 2000a), and low self-esteem (Johnson et al. 2000a) have been found to be associated with depression, but not mania.

Unipolar depression and bipolar depression have been shown to be predicted by parallel socioenvironmental triggers (see Johnson et al. 2009, for a review). For example, 66 % of people with unipolar depression and

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64 % of those with bipolar disorder had experienced at least one adverse life event, such as divorce or unemployment, shortly before their death (Isometsä et al. 1994). In addition, researchers have found that low social support predicts increases in both bipolar and unipolar depression (Cohen et al. 2004; Johnson et al. 1999, 2008) as does family conflict (Butzlaff and Hooley 1998; Kim and Miklowitz 2004; Yan et al. 2004). Hence, it is noted that the risk factors that predict unipolar depressive episodes are likely to predict bipolar depression as well. Here, then, we consider rejection sensitivity in relation to bipolar depression, drawing on a rich literature that establishes the importance of rejection sensitivity for understanding unipolar depression.

Rejection sensitivity has been conceptualized as a disposition to agitatedly anticipate, readily perceive, and intensely overreact to cues of rejection in the behavior of others (Ayduk et al. 2000; Downey et al. 1998, 2000). People with high rejection sensitivity are more likely to interpret ambiguous interpersonal cues as signifying rejection, and consequently to experience greater discomfort, compared to people with low rejection sensitivity (Burklund et al. 2007). It has been theorized that the concept of rejection is chronically accessible and easily activated among people with high rejection sensitivity (Ayduk et al. 1999; Downey et al. 2004; Pietrzak et al. 2005). Together, these cognitive processes not only heighten reactivity to rejection cues when they happen, but also promote the development of anxious expectation of rejection (Mor and Inbar 2009). These tendencies towards oversensitivity change behavioral patterns in ways that can lead to actual rejection (Downey and Feldman 1996; Mor and Inbar 2009). As one example, women with high levels of rejection sensitivity have been found to respond to rejection in an aggressive manner (Ayduk et al. 1999).

Research also indicates that rejection sensitivity can be differentiated from a more general pattern of emotional reactivity, in that rejection sensitivity appears to be specific to rejection cues. For example, women high in rejection sensitivity show a differential responsivity on semantic tasks after they are primed with rejection words as compared to either neutral (e.g., chair) or negative words (e.g., disgust) (Ayduk et al. 1999). People high in rejection sensitivity also display greater activity in the dorsal anterior cingulate cortex (dACC), a region implicated in the unpleasant affective component of physical pain, to rejection-related stimuli, but not to anger-related or disgust-related stimuli (Burklund et al. 2007; Eisenberger et al. 2007; Kross et al. 2007). In sum, people with high rejection sensitivity appear to show increased behavioral and neural responsivity to rejection cues as compared to other negative emotional cues.

Rejection sensitivity has been shown to predict the course and outcome of depression. Greater interpersonal sensitivity is associated with more depressive symptoms (Ayduk et al. 2001; Downey and Feldman 1996), greater severity and duration of current major depressive episodes (Posternaka and Zimmerman 2001), increased propensity toward depression over time (Boyce et al. 1991), and among people with clinical depression, decreased likelihood of being clinically remitted at 1-year follow-up (Boyce et al. 1992). Recent studies have found that increased rejection sensitivity during depressive episodes was linked to increased physical pain in both unipolar and bipolar depression (Ehnvall et al. 2009, 2011). There is also evidence demonstrating that rejection sensitivity is correlated with poor psychosocial outcome (Canu and Carlson 2007; Pachankis et al. 2008). For instance, adults who are sensitive to rejection are more likely to behave in ways that undermine their partners' relationship satisfaction and commitment, contributing to higher rates of relationship dissolution 1 year after baseline (Downey and Feldman 1996; Downey et al. 1998). Patients with bipolar disorder are often affected by residual depressive symptoms, poor psychosocial outcome, and impaired quality of life, even during periods of remission (MacQueen et al. 2001; Yen et al. 2008). The correlations between rejection sensitivity, depression, and psychosocial outcome suggest that it may be meaningful to investigate whether rejection sensitivity plays a role in the poor outcomes of bipolar disorder.

To date, it is unclear how rejection sensitivity influences patients with bipolar I disorder. Two goals of this paper were to examine whether people with bipolar disorder experience elevated rejection sensitivity compared to controls and to examine the effects of rejection sensitivity on symptomatic outcome. Drawing on a broad literature demonstrating sizable overlap in the risk factors of bipolar and unipolar depression (Johnson et al. 2009) and differential predictors of bipolar depression and mania (Cuellar et al. 2005), we hypothesized that rejection sensitivity would be related to depression, but not mania. To examine this question, baseline and follow-up assessments of symptom severity were conducted. A third goal was to examine the effects of rejection sensitivity on quality of life and psychosocial outcome within the bipolar sample, given the extremely heterogeneous nature of quality of life and psychosocial outcome in this population even after accounting for symptom severity (Gitlin et al. 1995; Harrow et al. 1990). We hypothesized that rejection sensitivity would be negatively correlated with quality of life, psychological well-being, and social support.

Method

The current data were drawn from an ongoing study of social and emotional functioning in people with bipolar I

disorder as compared to those with no mood disorder. The protocol was approved by the Institutional Review Board at the University of California, Berkeley. All participants completed written informed consent procedures. Only measures relevant to current analyses are described here.

Participants

The sample included 53 participants with bipolar I disorder as the primary diagnosis and 44 participants with no history of mood disorders (mania, hypomania, major depression, dysthymia, or cyclothymia), as assessed by the Structured Clinical Interview for *DSM-IV* (SCID; First et al. 1997). Although initial participants were not assessed, a subset of 38 participants in the bipolar group completed symptom interviews at a 6-month follow-up session. Participants were recruited from the San Francisco Bay Area via online advertisements, flyers forwarded to local mental health practitioners, and referrals from treatment centers in the community. Most control participants were recruited through community flyers and web-based advertising. Participants were excluded from either the bipolar or control group for: (1) mood symptoms secondary to a general medical condition; (2) alcohol or substance abuse or dependence in the past 6 months, or daily substance use in the past 6 months; (3) being unable to independently complete self-report measures due to cognitive or language limitations; (4) suffering from a primary psychotic disorder other than bipolar disorder; (5) being under the age of 18 or over the age of 60; or (6) medical diseases that may influence the course of bipolar disorder, such as neurological conditions. Participants in the control group were excluded if they had a first-degree relative with a history of bipolar disorder. To increase comparability with the bipolar participants, controls who were suffering from the two most common comorbid conditions in bipolar populations—lifetime substance-related diagnoses and lifetime anxiety disorders—were eligible for inclusion in the control group. No control participants were diagnosed with a current major psychiatric disorder.

Materials

Structured Clinical Interview for DSM-IV (SCID)

The SCID (First et al. 1997) was used to assess current and lifetime diagnoses of Axis I disorders, including mood disorders and other comorbid conditions, such as anxiety disorders, psychosis, eating disorders, pathological gambling, and alcohol/substance use disorders. The SCID is the most commonly used structured interview for psychiatric diagnosis based on *DSM-IV* criteria. Previous research demonstrates that it has strong inter-rater reliability and correspondence with expert diagnoses (Brown et al. 2001). All interviewers completed formal training in psychopathology as part of their doctoral training in clinical psychology, and then completed specific readings and didactic workshops regarding the SCID. Before completing interviews for the study, interviewers established reliability and met interviewing guidelines. To evaluate inter-rater reliability of SCID diagnoses, four judges independently rated 10 randomly selected audiotaped interviews. Inter-rater reliability of all diagnostic categories as evaluated using intraclass correlations for ordinal data with absolute agreement as the criterion, was excellent, intraclass correlation coefficients (ICCs) = .880 to .889 for current manic episode, lifetime manic episode, lifetime major depressive episode, and .995 for current major depressive episode.

Adult Rejection Sensitivity Questionnaire (A-RSQ)

The A-RSQ (Berenson et al. 2009) is a self-report measure designed to assess rejection sensitivity. Participants read 9 hypothetical situations in which interpersonal rejection is possible (e.g. "you ask your supervisor for help with a problem you have been having at work"). For each situation, the participants are asked to report the degree of anxiety they would feel about the possibility of rejection on a scale of 1 (*very unconcerned*) to 6 (*very concerned*) and the likelihood that the other person would respond positively on a scale of 1 (*very likely*) to 6 (*very unlikely*). In the validation article, convergent validity was demonstrated by correlations of the A-RSQ with neuroticism, self-esteem, interpersonal sensitivity, depression, attachment anxiety and attachment avoidance, and social avoidance/distress (Berenson et al. 2009). The A-RSQ was also shown to correlate .87 with the original Rejection Sensitivity Questionnaire (RSQ; Downey and Feldman 1996), which is geared towards college students. Internal consistency was adequate in this sample, with $\alpha = .72$.

Young Mania Rating Scale (YMRS)

The YMRS (Young et al. 1978) is an 11-item interviewer-administered scale designed to assess the severity of manic symptoms in the past week. The YMRS is one of the most widely used measures for evaluating manic symptom severity. The scale is based on the core symptoms of mania, such as elevated mood, increased motor activity or energy, and irritability. Most items are rated on a scale of 0–4, where higher scores represent greater symptom severity. Scores range from 0 to 60. A score of 7 or below signifies symptomatic remission in people with bipolar I disorder. The scale has been shown to achieve high inter-rater reliability and to correlate robustly with other mania rating scales (Young et al. 1978).

Altman Self-Rating Mania Scale (ASRM)

The ASRM (Altman et al. 1997) is a 5-item self-report questionnaire designed to measure the severity of manic symptoms, including elevated mood, inflated confidence, decreased need for sleep, excessive physical activity, and talkativeness. The five items have been shown to load together on a single factor, and the scale achieves strong correlations with other self-report and interview mania measures (Altman et al. 2001). Possible scores range from 0 to 20.

Modified Hamilton Rating Scale for Depression (MHRSD)

The MHRSD (Miller et al. 1985) is a 17-item interviewer-administered measure designed to assess the severity of current (past week) depressive symptoms. It is derived from and assesses the same symptoms as the Hamilton Rating Scale for Depression (HRSD; Hamilton 1980), but provides standardized prompts and clear behavioral anchors for each item. The MHRSD is widely employed, is sensitive to changes in clinical status, has shown satisfactory reliability, and has strong correlations with the original HRSD and other depressive symptom measures in previous studies (Keitner et al. 1992). The scale has also been validated in bipolar disorder (Johnson et al. 2000b, 2008).

Before completing symptom severity measures (MHRSD and YMRS), interviewers completed extensive didactic and role-play training, mirroring procedures employed with SCID training, and they demonstrated reliability with gold standard tapes. Reliability was checked through ratings of audiotaped interviews on an ongoing basis. Inter-rater reliability of our team, as assessed by 3 raters reviewing 4 randomly selected tapes, was high, intraclass correlation for YRMS = .999 and for MHRSD = .989.

Beck Depression Inventory-Short Form (BDI-SF)

The BDI-SF (Beck and Beck 1972) is a 13-item self-rating measure designed to assess current symptoms of depression. Each item covers a different symptom, and for each item, four response choices are provided ranging from no symptom to severe symptom levels. The BDI is widely used and has demonstrated adequate reliability and validity in both clinical and non-clinical samples (Beck et al. 1988). The BDI-SF is highly correlated with the original BDI, with correlations ranging from .89 to .97 (Beck et al. 1974). Possible scores range from 0 to 36.

Quality of Life in Bipolar Disorder-Short Form (QoL.BD-SF)

The QoL.BD-SF (Michalak et al. 2010) is a 12-item self-rating measure developed to evaluate the quality of life of patients with bipolar disorder over the preceding week in 12 domains: physical health, sleep, mood, cognitive, leisure, social, spirituality, finances, household, self-esteem, independence, and identity. To develop this brief version of the QoL.BD, the authors selected items with high factor loadings and communalities from each of the 12 original domains. Participants were instructed to rate each item on a 5-point Likert-like scale, with 1 being "strongly disagree" and 5 "strongly agree" (Michalak et al. 2010). In the original article, the QoL.BD-SF was shown to correlate with medical outcomes, subjective well-being, life satisfaction, and state mood, demonstrating convergent validity (Michalak et al. 2010). The short subscales of the QoL.BD-SF were also found to be adequately correlated with the original subscales of the QoL.BD, with correlations ranging from .51 to .86 (Michalak et al. 2010). A total score is calculated as the mean across domains.

Interpersonal Support Evaluation List (ISEL)

The ISEL (Cohen et al. 1985) is a self-rating measure designed to assess perceived social support. To capture emotional and pragmatic aspects of social support, the Tangible Assistance and Appraisal subscales were administered in the current study. The Tangible Assistance subscale captures perceived material aid provided by others (e.g., "if I were sick, I could easily find someone to help me with my daily chores"). The Appraisal subscale captures the availability of someone in whom to confide (e.g., "there is someone I can turn to for advice about handling problems with my family"). Items are rated on a scale ranging from 1 (*definite true)* to 4 (*definitely false)*. The scale has been shown to have strong factor-analytic support, with high internal consistency ($\alpha = .90$) and 6-month test–retest reliability (.74) in community studies (Cohen et al. 1985). Previous reports have found that the scale correlates well with depression (Lara et al. 1997) and other expected outcomes (Rogers et al. 2004). In the present study, the alphas for the subscales were $\geq .82$. The two ISEL subscales were moderately correlated, $r = .61$.

Scale of Psychological Well-Being-Short Form (SPWB-SF)

The SPWB-SF (Ryff and Keyes 1995) is an 18-item self-report scale that was designed to measure psychological well-being. There are six separable domains or subscales: Autonomy (e.g., "I judge myself by what I think is important, not by the values of what others think is important"), Environmental Mastery (e.g., "in general, I feel I am in charge of the situation in which I live"), Self-Acceptance (e.g., "when I look at the story of my life, I am pleased with how things have turned out"), Positive Relationships with Others (e.g., "people would describe me as a giving person, willing to

share my time with others"), Personal Growth (e.g., "I think it is important to have new experiences that challenge how you think about yourself and the world"), and Purpose in Life (e.g., "some people wander aimlessly through life, but I am not one of them"). The three items in each subscale of the SPWB-SF were chosen from the relevant subscales of the SPWB. Each item was scored from 1 (*strongly disagree*) to 6 (*strongly agree*). The short subscales were found to be satisfactorily correlated with the parent subscales, with correlations ranging from .70 to .89 (Ryff and Keyes 1995). Internal consistencies ranged from .33 to .56 (Ryff and Keyes 1995). The authors reported that these low alphas were expected, as the items were chosen to reflect the conceptual breadth of the constructs rather than to maximize internal consistency. Because internal consistency estimates in this study were low for Life Purpose, $\alpha = .32$, Personal Growth, $\alpha = .44$, and Positive Relationships with Others, $\alpha = .54$, these scales were not included in analyses. Internal consistency estimates for the other subscales were adequate, Autonomy, $\alpha = .68$, Environmental Mastery, $\alpha = .69$, and Self-Acceptance, $\alpha = .82$. The three SPWB subscales were moderately inter-correlated, r's = .37 to .71 in this sample.

Procedure

Potential participants took part in a telephone screening interview to establish preliminary eligibility for the study. Participants who met preliminary eligibility criteria were then invited to the university to participate in a diagnostic interview. Eligible participants were invited back to the university to complete the rejection sensitivity measure and other computerized tasks and questionnaires. Before participants with bipolar disorder were scheduled for these sessions, they were required to meet criteria for symptom remission, defined as cutoff scores of <7 on the YMRS (Young et al. 1978) and <9 on the MHRSD (Miller et al. 1985).The cutoffs have been defined and validated in previous research (Chengappa et al. 2003; Clark et al. 2005; Thompson et al. 2005). Phone interviews were conducted on a monthly basis until bipolar participants achieved these criteria. Remission status was verified in the 2 days before sessions. To investigate whether rejection sensitivity predicted change in symptoms, a 6-month follow-up telephone assessment was conducted for the bipolar group to evaluate their mood symptoms, using the same symptom measures. Previous research has demonstrated the reliability and validity of telephone assessments for evaluating symptom severity (Potts et al. 1990; Simon et al. 1993).

Results

Preliminary Analyses

Sample characteristics are shown in Table 1. Group differences in categorical variables were examined using Chi square tests, and in continuous variables using t tests. None

Table 1 Demographic and illness characteristics by diagnostic group

Characteristics	Bipolar I ($n = 53$) *M* (SD) or %	Control ($n = 44$) *M* (SD) or %
Age (year)	35.21 (11.40)	32.07 (12.78)
Gender (% female)	56.6	52.3
Marital status (% single)	60.4	61.4
Employment status (% employed)	45.3	52.3
Years of education	15.25 (1.90)	15.27 (1.85)
Lifetime diagnosis of alcohol or substance abuse/dependence***	62.26	9.09
Lifetime diagnosis of anxiety disorder***	58.49	4.55
Number of MDE episodes	10.54 (14.86)	
Number of hospitalizations for MDE	0.45 (1.05)	
Age of MDE onset	17.82 (7.12)	
Number of manic episodes	7.56 (8.96)	
Number of hospitalizations for mania	1.76 (2.58)	
Age of mania onset	21.21 (7.43)	

MDE Major Depressive Episode per SCID. Number of MDE episodes was missing for 6 individuals; number of hospitalizations for MDE, number of hospitalizations for mania, and age of mania onset were missing for 2 individuals; number of manic episodes could not be estimated for 4 individuals; and age of MDE onset could not be estimated for 8 individuals. Group differences in categorical variables were examined using Chi square tests, and in continuous variables using t tests

*** $p < .001$

Table 2 Descriptive statistics of key outcome measures

Variable	α	Bipolar I ($n = 53$)		Control ($n = 44$)	
		M	SD	M	SD
BDI-SF	.76	3.51	2.85	0.84	1.45
ASRM	.72	3.08	2.70	2.52	2.92
Baseline MHRSD	.51	2.69	2.51		
Follow-up MHRSD[a]	.85	8.23	6.00		
Baseline YMRS	.48	1.58	1.93		
Follow-up YMRS[b]	.85	6.19	6.23		
QoL.BD-SF	.83	43.37	6.43	47.76	5.07

BDI-SF Beck Depression Inventory-Short Form, *ASRM* Altman Self-Rating Mania Scale; *MHRSD* Modified Hamilton Rating Scale for Depression; *YMRS* Young Mania Rating Scale; *QoL.BD-SF* Quality of Life in Bipolar Disorders Scale-Short Form. In the bipolar group, follow-up YMRS and QoL.BD-SF were missing for 1 individual. Note that there was little variability in baseline MHRSD and YRMS scores by study design, so these alpha coefficients were constrained. Paired-samples t-tests indicated increases in MHRSD and YMRS scores over the follow-up period, all t's < 5.83, all p's $< .001$

[a] $n = 38$

[b] $n = 37$

of the Chi square tests or t tests of demographic variables achieved statistical significance. Bipolar participants had significantly higher rates of lifetime substance-related disorders and lifetime anxiety disorders than control participants. T-tests suggested no significant differences in baseline rejection sensitivity, nor in interview-based or self-reported depression or mania scores between those who did and did not complete follow-up, all t's <1.22, all p's >.05. No significant correlations were found between rejection sensitivity (A-RSQ) and the demographic variables. Descriptive statistics of key outcome variables are shown in Table 2. All variables were normally distributed, with the exception of baseline mania (ASRM) and follow-up mania (YMRS) scores, which were modestly leptokurtic, kurtosis estimates = 2.19 (SE = .64) and 2.14 (SE = .76) respectively.

Correlations among the symptom measures in the bipolar sample were in the expected range. As shown in Table 3, mania scores were moderately intercorrelated and depression scores were intercorrelated, with the exception that correlations with baseline scores were truncated by the limited range (by study design). Also congruent with previous literature, some significant correlations were observed between some indices of depression and mania (Kessler et al. 2005; McGuffin et al. 2003).

The QoL.BD-SF scale was highly correlated with the SPWB-SF Environmental Mastery subscale, $r(50) = .50$, $p < .001$, the SPWB-SF Self-Acceptance subscale, $r(50) = .49$, $p < .001$, and more modestly correlated with the SPWB-SF Autonomy subscale, $r(50) = .29$, $p = .04$. The ISEL subscales were uncorrelated with the SPWB-SF Autonomy subscale, $|r$'s$| < .01$ and with the QoL.BD-SF, r's $< .22$. ISEL subscales were moderately correlated with the SPWB-SF Environmental Mastery and Self-Acceptance subscales, r's = .30 to .50.

Comparison Between the Bipolar and Control Groups

An independent-samples t test was conducted to compare the rejection sensitivity scores (A-RSQ) for the two groups. People with bipolar disorder endorsed higher rejection sensitivity, $M = 10.94$, SD = 4.16, than did controls, $M = 8.07$, SD = 3.42, $t(95) = 3.67$, $p < .001$; $d = 0.75$. An ANCOVA was conducted to examine whether the elevation in rejection sensitivity was explained by current depressive symptoms. Group differences were not statistically significant when controlling for current depression (BDI-SF), $F(1, 94) = 2.30$, $p = .13$.

Analyses Within the Bipolar Sample

As shown in Table 4, among those with bipolar disorder, rejection sensitivity (A-RSQ) was correlated with self-report (BDI-SF) but not interviewer-rated (MHRSD) measures of current depression. As expected, A-RSQ was uncorrelated with both self-report (baseline ASRM) and interviewer-rated (baseline YMRS) indices of current mania. Rejection sensitivity scores prospectively predicted changes in depression (MHRSD), but not mania (YMRS), from baseline to 6-month follow-up, controlling for baseline MHRSD and YMRS.

Rejection sensitivity was correlated with quality of life (QoL.BD-SF), with social support (ISEL) measures of Appraisal and Tangible Assistance, and with psychological well-being (SPWB-SF) indices of Environmental Mastery, Self-Acceptance, and Autonomy. Bivariate correlations of A-RSQ and measures of symptom and psychosocial outcome are shown in Table 4.

Discussion

The current study provides the first examination of rejection sensitivity in bipolar I disorder. The present findings establish that persons with bipolar I disorder are highly sensitive to rejection compared to a control group with no mood disorders. Rejection sensitivity was particularly apparent among those persons with bipolar disorder who were experiencing current depression. Rejection sensitivity was related to the course of depression, quality of life, social support, and psychological well-being among participants with bipolar I disorder.

Drawing from previous psychological research on bipolar disorder, it was hypothesized that rejection sensitivity would be correlated with bipolar depression but not

Table 3 Intercorrelations among symptom measures in the bipolar group

Measures	BDI-SF	ASRM	Baseline MHRSD	Follow-up MHRSD	Baseline YMRS	Follow-up YMRS
BDI-SF	–					
ASRM	.31*	–				
Baseline MHRSD	.63***	.34*	–			
Follow-up MHRSD	.26	.21	.15	–		
Baseline YMRS	.07	.40**	.19	.57***	–	
Follow-up YMRS	.17	.25	.25	.65***	.39*	–

Baseline $n = 53$; follow-up n's = 38 for MHRSD and 37 for YMRS

BDI-SF Beck Depression Inventory-Short Form, *ASRM* Altman Self-Rating Mania Scale, *MHRSD* Modified Hamilton Rating Scale for Depression, *YMRS* Young Mania Rating Scale

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 4 Correlations of A-RSQ with measures of symptoms, psychosocial outcome and quality of life in the bipolar group

Measures	A-RSQ ($n = 53$)
BDI-SF	.45***
ASRM	.20
Baseline MHRSD	.11
Follow-up MHRSD controlling for baseline[a]	.42*
Baseline YMRS	.15
Follow-up YMRS controlling for baseline[b]	.15
ISEL—Appraisal[c]	−.29*
ISEL—Tangible[c]	−.34*
SPWB-SF—EM	−.52***
SPWB-SF—SA	−.48***
SPWB-SF—AU	−.35**
QoL.BD-SF[d]	−.36**

A-RSQ Adult Rejection Sensitivity Questionnaire, *BDI-SF* Beck Depression Inventory-Short Form, *ASRM* Altman Self-Rating Mania Scale, *MHRSD* Modified Hamilton Rating Scale for Depression, *YMRS* Young Mania Rating Scale, *ISEL* Interpersonal Support Evaluation List, *SPWB-SF* Scale of Psychological Well-Being-Short Form (*EM* Environmental Mastery subscale, *SA* Self-Acceptance subscale, *AU* Autonomy subscale); *QoL.BD-SF* Quality of Life in Bipolar Disorders Scale-Short Form. *Controlling for baseline* controlling for baseline MHRSD and YMRS

* $p < .05$; ** $p < .01$; *** $p < .001$

[a] $n = 38$

[b] $n = 37$

[c] $n = 49$

[d] $n = 52$

mania. As hypothesized, among people with bipolar I disorder, rejection sensitivity was associated with current self-ratings of depression as well as predicted increases in interviewer-rated depression scores at 6-month follow-up, partialling out depressive and manic symptoms at baseline. No statistically significant associations were found of rejection sensitivity with current mania or changes in manic symptoms over the 6-month follow-up period. The present findings extend previous evidence that rejection sensitivity is correlated with and predicts the course of unipolar depression (Boyce et al. 1991, 1992) by showing that rejection sensitivity also influences bipolar depression, but not mania.

The current study is also the first study to show that rejection sensitivity might influence quality of life and psychosocial outcome among individuals with bipolar disorder. As hypothesized, within the bipolar sample, rejection sensitivity was negatively correlated with quality of life, social support, and psychological well-being. The results suggest that bipolar patients who experienced elevated rejection sensitivity had lower quality of life, less material assistance provided by others, and fewer people to talk to about their problems. In terms of psychological well-being, they were more likely to feel disappointed in themselves, to evaluate themselves by the expectations and evaluations of others, and to feel incapable of improving or changing the surrounding environment.

Although findings provide support for hypotheses, it is important to interpret the results with caution. One caveat regarding the current findings is the use of self-report measure of rejection sensitivity. The correlations of rejection sensitivity with self-rated depression and psychosocial outcomes might have occurred as a function of common method bias. In baseline cross-sectional analyses, we also observed a significant effect of rejection sensitivity on self-rated, but not interviewer-rated, depression, which could be related to a tendency for those who are experiencing depression to evaluate themselves more harshly (Wisco and Nolen-Hoeksema 2010). The relative absence of an effect of rejection sensitivity on baseline interviewer ratings of depression and the insignificant difference in rejection sensitivity between the bipolar and control groups when controlling for self-report depression are consistent with the idea of bias in self-ratings inflating reports of rejection sensitivity and other concerns. It should be noted, though, that interviewer ratings of depression at baseline

were constrained in this study by the stringent inclusion criteria that interviewer-based depression scores be in the remission range. It should also be emphasized that rejection sensitivity did predict increases in depression over the follow-up period on an interview-based scale, suggesting that findings linking rejection sensitivity with depression are not merely an artifact of common method variance.

Beyond concerns about rejection sensitivity, it should be noted that mania scores were leptokurtic. The lack of range in mania scores may have limited the magnitude of correlations observed between mania and rejection sensitivity.

Finally, results should be interpreted cautiously because some potentially relevant variables that correlate with both rejection sensitivity and outcome were not examined or controlled in this study. For example, self-blame (Gilbert et al. 2006), rumination (Pearson et al. 2011), neuroticism (Downey and Feldman 1996), pessimism (Downey et al. 1998), emotion dysregulation (Selby et al. 2010), and low self-esteem (Downey and Feldman 1996) may interact with rejection sensitivity in predicting depression.

Despite the methodological limitations, current findings do indicate that rejection sensitivity is a promising topic for further study. Ideally, future research will take a multi-method approach to studying rejection sensitivity. In addition to self-report measures, researchers might gather observer's ratings, or cognitive, behavioral and psychophysiological responses as indices of rejection sensitivity levels (Ayduk et al. 2003; Downey et al. 2004; Gyurak and Ayduk 2007; Kross et al. 2007). Beyond improvements in the assessment methods, it is important to note that the directionality of effects cannot be disentangled in this study. Participants who had experienced more severe symptoms and more severe repercussions of their disorder might develop more sensitivity to cues of rejection. That is, stigma concerning mental illness may be an important hidden variable that was not considered in this study. In an ideal study, researchers might trace levels of rejection sensitivity premorbidly in samples of people at risk for bipolar disorder (e.g., children of bipolar parents), and then conduct longitudinal assessments to consider how baseline sensitivities influence outcomes over time.

The current findings underline the importance of interpersonal-cognitive factors for understanding and treating depression within bipolar disorder. Current findings suggest that people with bipolar disorder, even during remission, might tend to view ambiguous interpersonal cues as signals of rejection and might respond more intensely when rejection does occur. Previous research has suggested that the rejection sensitivity scale is correlated with a range of destructive behaviors, such as self-harm, hostility, and substance abuse, that may undermine well-being and interpersonal relationships (Ayduk et al. 1999, 2000, 2008). Cognitive-behavioral therapy and interpersonal therapy, which modify maladaptive schemas and target relationship issues, could be tested as potential approaches to reducing rejection sensitivity. Similar to other cognitive approaches to depression, these could be implemented during depressed and euthymic, but not manic periods of bipolar disorder. Lessening rejection sensitivity may have promising effects for treating bipolar depression, given that rejection sensitivity accounted for a relatively large proportion of the variance in follow-up depressive symptoms, even after adjusting for baseline depression and mania. In sum, the present study demonstrates that bipolar disorder patients are highly sensitive to rejection even during periods of remission. In addition, it has shown that rejection sensitivity predicts the course of bipolar depression and is associated with quality of life, social support, and psychological well-being. Given the robust association between rejection sensitivity and depression, therapists should be aware of the importance of interpersonal-cognitive factors for understanding and treating depression within bipolar disorder. Future work should employ a multi-method longitudinal approach to further explore the consequences of rejection sensitivity within bipolar disorder.

Acknowledgments This project was supported by NIMH Grant R01 MH 076021 to Sheri L. Johnson. The authors express their gratitude to all the participants for their indispensable contributions to the current study. The authors also thank Michael D. Edge and M. Kathleen Holmes for their assistance in data management and collection.

Conflict of interest The authors report no conflicts of interest.

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