

Brief Report

Do positive emotions predict symptomatic change in bipolar disorder?

Gruber J, Culver JL, Johnson SL, Nam JY, Keller KL, Ketter TA. Do positive emotions predict symptomatic change in bipolar disorder? *Bipolar Disord* 2009; 11: 330–336. © 2009 The Authors. Journal compilation © 2009 Blackwell Munksgaard.

Objectives: Bipolar disorder is associated with positive emotion disturbance, though it is less clear which specific positive emotions are affected.

Methods: The present study examined differences among distinct positive emotions in recovered bipolar disorder (BD) patients (n = 55) and nonclinical controls (NC) (n = 32) and whether they prospectively predicted symptom severity in patients with BD. At baseline, participants completed self-report measures of several distinct trait positive emotions. Structured assessments of diagnosis and current mood symptoms were obtained for BD participants. At a six-month follow-up, a subset of BD participants' (n = 39) symptoms were reassessed.

Results: BD participants reported lower joy, compassion, love, awe, and contentment compared to NC participants. BD and NC participants did not differ in pride or amusement. For BD participants, after controlling for baseline symptom severity, joy and amusement predicted increased mania severity, and compassion predicted decreased mania severity at the six-month follow-up. Furthermore, amusement predicted increased depression severity and pride predicted decreased severity of depression. Awe, love, and contentment did not predict symptom severity.

Conclusions: These results are consistent with a growing literature highlighting the importance of positive emotion in the course of bipolar disorder.

**June Gruber^a, Jenifer L Culver^b,
Sheri L Johnson^c, Jennifer Y Nam^c,
Kristine L Keller^b and Terence A
Ketter^b**

^aDepartment of Psychology, University of California, Berkeley, ^bDepartment of Psychiatry and Behavioral Sciences, Stanford University School of Medicine, Stanford, CA, ^cDepartment of Psychology, University of Miami, Miami, FL, USA

Key words: bipolar disorder – emotion – positive emotion

Received 5 May 2008, revised and accepted 26 September 2008

Corresponding author:
Dr. June Gruber
Department of Psychology
University of California, Berkeley
2205 Tolman Hall #1650
Berkeley, CA 94720-1650, USA
e-mail: june@berkeley.edu

Bipolar disorder (BD) is a chronic psychiatric illness associated with profound functional impairment and morbidity (1). Despite advances in treatments (2), the risk of relapse remains high. Thus, it is important to refine our understanding of mechanisms that may contribute to interepisode dysfunction and predict subsequent relapse.

Several lines of evidence converge to suggest the importance of positive emotional disturbance in BD. First, one hallmark feature of BD is an abnormally elevated mood characteristic of periods

of mania (3, 4). Second, people at risk for BD (as defined by high scores on self-report screens) and those diagnosed with BD exhibit heightened positive emotional responses (5). For example, two studies demonstrated that BD is associated with greater self-reported excitement at the prospect of earning rewards compared to controls (6, 7). People at high risk for BD exhibit more robust startle eye-blink attenuation to positive photos, an indirect marker of positive affect, compared to low-risk participants (8). At-risk BD samples also report greater positive affect and exhibit elevated cardiac vagal tone, an autonomic correlate of positive emotion, across distinct types of emotional films (9). Third, experience-sampling studies sug-

The authors of this paper do not have any commercial associations that might pose a conflict of interest in connection with this article.

gest that people with BD reported elevated positive affect across many different contexts in their daily lives compared to controls (10). Taken together, these studies suggest that BD may be associated with elevated positive emotionality.

Despite robust findings, prior work on positive emotion in BD has tended to assess positive emotion in terms of one-dimensional ‘happiness’ or ‘positivity’ constructs. Recent work in affective science has supported the validity of differentiating multiple positive emotions (11–13) that broaden and build cognitive and social resources (11, 14). Indeed, four distinct positive emotions have begun to receive empirical attention; these include pride, compassion, happiness/joy, and amusement. First, *pride* is a self-oriented emotion that signals elevated status, relevant for negotiating social hierarchies (14–16). *Compassion* [also referred to as sympathy (17)] is conceptualized as an other-oriented emotion that promotes shifting attention away from oneself and toward vulnerable individuals (18, 19). *Happiness/joy* is a reward-oriented emotion that refers to the high-arousal state felt when the environment signals an imminent improvement in resources, and one must expend energy to acquire reward (13, 14, 20, 21). *Amusement*, a knowledge-oriented emotion, is experienced during a cognitive shift from one knowledge structure to another, such as during a joke’s punch line, and is thought to facilitate creative thinking (22, 23). Three positive emotions that have received less empirical support are love, awe, and contentment. *Love* is a multifaceted term that includes the positive component of Bowlby’s attachment behavioral program (e.g., 18). *Awe* has been discussed as an emotional response to novel and complex stimuli that current knowledge structures must assimilate (24). Finally, *contentment* is experienced when one’s resource needs have been satisfied (11). Given these varieties of positive emotion, where might we expect to see more fine-grained deficits in BD?

Our research group has completed two studies implicating specific positive emotions in BD. Results indicated that people at risk for BD report greater state and trait joy and pride relative to compassion (9, 25). These findings dovetail with a growing literature suggesting that risk for BD involves a heightened focus on the pursuit of rewards and achievement of ambitious goals (26). No studies, however, have yet examined specific positive emotions in a clinically diagnosed BD sample. Furthermore, few studies have examined associations between positive emotion and clinical course in BD. Initial evidence, however, suggests that self-reported sensitivity to reward predicts increases in

manic symptoms (7, 26). It will be important to ascertain the role positive emotion plays in predicting symptom severity and function in BD.

Materials and methods

Overview of present study

Our first aim was to compare self-reports of seven distinct positive emotions (joy, pride, compassion, amusement, awe, love, and contentment) between BD and NC participants. Based on literature described above (25, 26), we predicted that BD participants would report greater trait reward (joy) and achievement (pride) positive emotions compared to NC participants. Because previous work has not shown that at-risk BD samples demonstrate elevations in amusement or compassion (7, 25), we did not predict group differences on these two emotions. For compassion, these findings are consistent with the notion that BD is associated with specific perturbations in self-, but not other-, oriented affective states. In the case of amusement, such predictions are consistent with clinical conceptualizations of abnormal amusement-related behavior during manic, but not interepisode, periods in BD.

Our second aim was to examine whether these trait positive emotions predicted symptom severity and functioning in BD at a six-month follow-up assessment. On the basis of literature linking reward sensitivity and ambitious goal setting with increased symptom severity (e.g., 26) and associations between heightened creativity and symptoms of mania (27), we hypothesized that trait joy, pride, and amusement would predict increased symptoms of mania and decreased functioning. Based on literature implicating the mental health benefits of prosocial emotions (13), in addition to mindfulness research discussing the benefits of prosocial states such as compassion (e.g., 28), we hypothesized that compassion would predict decreased mania and depression symptom severity and improved functioning. Given the lack of empirical background on the other three emotions (awe, contentment, and love), we did not have specific hypotheses for these emotions.

Participants

Demographic and clinical characteristics are listed in Table 1. The BD participants included 55 individuals between the ages of 18 and 69 who were diagnosed with bipolar I disorder (BD I) ($n = 27$), bipolar II disorder (BD II) ($n = 21$), or bipolar disorder not otherwise specified (BD NOS)

Table 1. Demographic and clinical characteristics at initial evaluation (T1) and six-month follow-up (T2)

	T1		T2
	BD (n = 55)	NC (n = 32)	BD (n = 39)
Demographic characteristics			
Age ^a	41.93 (14.14)	34.08 (10.76)	42.12 (13.16)
% Female	69.1	65.4	76.9
% Caucasian ^a	80.0	50.0	79.5
% Partnered ^a	44.4	26.9	47.4
% Employed/student	66.7	73.1	66.7
Education (years)	16.52 (3.18)	15.38 (2.10)	17.03 (2.47)
Annual household income	\$68,061.54 (\$44,653.98)	\$63,739.13 (\$50,585.86)	\$99,345.30 (\$104,265.37)
Clinical characteristics			
Illness duration (years)	18.13 (14.85)	–	18.46 (14.48)
Number of hospitalizations	2.35 (4.81)	–	1.97 (4.26)
% Receiving psychotherapy ^{a,b}	49.1	–	45.9
% Receiving pharmacotherapy ^a	100	–	100
SUM-M	0.60 (0.78)	–	0.94 (1.15)
SUM-D	1.44 (1.56)	–	1.96 (2.09)

Mean values are displayed with standard deviations in parentheses where applicable.

^ap < 0.05 for BD and NC at T1.

^bPsychotherapy referred to current participation in individual or group therapy.

BD = bipolar disorder participants; NC = nonclinical control participants; SUM-M = severity of manic symptoms; SUM-D = severity of depressive symptoms.

(n = 7). All BD participants were recovered (euthymic for at least two months) at study entry. We focused on recovered BD participants to examine whether the tendency to experience distinct types of positive emotions represented a trait-like, rather than a mood-state-dependent, feature of BD. The NC group included 32 individuals between the ages of 18 and 59 with no lifetime psychiatric diagnoses.

Procedure

The study was approved by the Stanford University Administrative Panel on Human Subjects. All subjects provided verbal and written informed consent prior to participation. Clinical diagnosis and symptom severity were rated by psychiatrists using the Affective Disorder Evaluation (ADE) (29) and the Clinical Monitoring Form (CMF) (30). BD patients were given a questionnaire packet to complete at home and return by mail. They completed the packet within an average of 13.84 days (SD = 14.36 days). This packet included a scale assessing distinct trait positive emotions (13). Symptoms and clinical status were assessed using the CMF during routine clinical care over the next year. The present study includes data from the six-month follow-up period as that was the period in which sufficient data on positive emotion were available. The mean interval between initial evaluation (T1) and six-month follow-up (T2) was 182.71 days (SD = 34.30 days). No financial compensation was given to BD participants.

NC participants were recruited from online ads and posted flyers and their status was confirmed using the Mini-International Neuropsychiatric Interview (MINI) (31). They then took home the same questionnaire packet and completed it, on average, 3.46 days (SD = 6.38 days) later and received US \$25.

Measures

Diagnostic evaluation. Diagnoses of BD were conducted using the ADE (29), a semi-structured interview adapted from the mood and psychosis modules of the Structured Clinical Interview for DSM-IV (SCID) (32), used widely in BD research (e.g., 33). These diagnoses were further confirmed using the MINI (31), a widely used structured interview designed to assess DSM-IV and ICD-10 diagnostic criteria.

Clinical symptoms. Symptom severity over the past week was assessed using the depression (SUM-D) and mood elevation (SUM-M) subscales of the CMF (30). Scores ranged from 0 to 19.8 and 0 to 13.5, respectively. Both the SUM-D ($\alpha = 0.83$) and SUM-M ($\alpha = 0.76$) scales have demonstrated high reliability in a larger ongoing study on treatment in BD (n = 6,981) conducted by the authors.

Dispositional Positive Emotion Scale (DPES). The DPES (13) is a 38-item self-report instrument with

seven 5- or 6-item scales for distinct trait positive emotions. In the present study we were primarily interested in four subscales of the DPES: *joy* (e.g., 'I am an intensely cheerful person'), *pride* (e.g., 'I am proud of myself and my accomplishments'), *compassion* (e.g., 'When I see someone hurt or in need, I feel a powerful urge to take care of them'), and *amusement* (e.g., 'I find humor in almost everything'). For completeness, we also reported data from the additional three subscales of *awe* (e.g., 'I often feel awe'), *contentment* (e.g., 'I am generally a contented person'), and *love* (e.g., 'I love many people'). Items were rated on a scale from 1 (strongly disagree) to 7 (strongly agree). In the present study, the average intercorrelation between the joy, pride, compassion, and amusement scales was $r = 0.34$ and internal consistency was good ($\alpha = 0.80$ for joy, $\alpha = 0.86$ for pride, $\alpha = 0.84$ for compassion, and $\alpha = 0.79$ for amusement).

Results

We first examined skewness and kurtosis. Because variable distributions approximated normalcy, transformations were not conducted. Preliminary analyses indicated that none of our demographic variables (gender, age, ethnicity, education, employment/student status, partnered status, household income) was associated with the trait positive emotions across both groups (p 's > 0.05), with a few exceptions. Specifically, contentment was associated with a decreased likelihood of being partnered ($r = -0.25$, $p < 0.05$) or employed ($r = -0.24$, $p < 0.05$) and love was positively associated with being Caucasian ($r = 0.30$, $p < 0.05$). Analyses for these two emotions included these variables as covariates. Only two BD participants (3.6%) relapsed at T2. Hence, analyses focused on continuous measures of symptom severity.

For BD participants, results indicated that neither illness duration, number of psychiatric hospitalizations, participation in individual psychotherapy, nor the number of psychotropic medications across five classes (i.e., mood stabilizers, antidepressants, anxiolytics, sedatives, and antipsychotics) was associated with any of the positive emotions (p 's > 0.10). Furthermore, there were no significant differences in these emotions among BD I, BD II, and BD NOS subtypes (p 's > 0.10).

As evident in Table 1, BD and NC participants did not differ with respect to gender [$\chi^2(1, n = 80) = 0.68$, $p = 0.71$], employment/student status [$\chi^2(1, n = 80) = 0.34$, $p = 0.56$], years of education [$F(1,80) = 2.73$, $p > 0.10$], or annual household income [$F(1,69) = 2.17$, $p > 0.10$]. BD

and NC participants did differ on age [$F(1,80) = 6.28$, $p < 0.05$], ethnicity [$\chi^2(1, n = 81) = 7.62$, $p < 0.01$], and partnered status [$\chi^2(1, n = 80) = 5.79$, $p < 0.05$]. BD participants were older, more predominantly Caucasian, and more frequently in a relationship compared to NC participants. Age, ethnicity, and partnered status were included as covariates in analyses comparing the two groups.

Univariate ANCOVAs controlling for age, ethnicity, and partnered status were conducted to examine positive emotion differences between BD and NC participants. Results indicated that BD participants ($M = 4.44$, $SD = 0.99$) reported lower joy compared to NC participants ($M = 5.87$, $SD = 0.89$), $F(1,79) = 7.31$, $p < 0.01$, $\eta_p^2 = 0.09$. BD participants ($M = 5.42$, $SD = 0.94$) also reported lower compassion relative to NC ($M = 5.87$, $SD = 0.79$) participants [$F(1,79) = 11.70$, $p = 0.001$, $\eta_p^2 = 0.14$]. For pride, BD ($M = 5.09$, $SD = 0.99$) and NC ($M = 5.46$, $SD = 0.90$) participants did not differ [$F(1,79) = 2.81$, $p > 0.05$, $\eta_p^2 = 0.04$]. Finally, BD ($M = 4.16$, $SD = 1.11$) and NC ($M = 4.53$, $SD = 1.06$) participants did not differ in amusement [$F(1,79) = 1.98$, $p > 0.10$, $\eta_p^2 = 0.03$]. Although not central to the study hypotheses, we note that compared to NC participants, BD participants reported lower awe [$F(1,79) = 6.18$, $p < 0.05$, $\eta_p^2 = 0.08$ (BD: $M = 4.84$, $SD = 1.00$; NC: $M = 5.29$, $SD = 0.85$)]; love [$F(1,79) = 12.03$, $p = 0.001$, $\eta_p^2 = 0.14$ (BD: $M = 4.71$, $SD = 1.08$; NC: $M = 5.32$, $SD = 0.81$)]; and contentment [$F(1,79) = 4.31$, $p < 0.05$, $\eta_p^2 = 0.06$ (BD: $M = 4.56$, $SD = 1.29$; NC: $M = 5.29$, $SD = 0.86$)] compared to NC participants.

Analyses between positive emotions and symptom severity at T1 were conducted on the entire BD sample. A total of 39 (70.9%) BD participants completed the T2 assessment and were used for analyses focusing on prospective associations between T1 and T2. As evident in Table 1, T2 completers and noncompleters did not differ on demographic or clinical characteristics.

We first examined concurrent and prospective associations between mania severity (SUM-M) and positive emotion. Bivariate correlations between the positive emotions and SUM-M scores at T1 did not reveal any significant associations (p 's > 0.05). To assess the unique contribution of trait positive emotion to change in mania severity, a hierarchical linear regression analysis was conducted with the SUM-M score at T2 as the dependent variable and the SUM-M score at T1 entered into block 1. Simultaneous entry was used in block 2 to examine whether T2 SUM-M scores were predicted by any

Table 2. Prospective association between trait positive emotion and symptom severity and functioning at six-month follow-up (T2) among bipolar disorder participants

	SUM-M	SUM-D
Joy	0.38 ^a	-0.13
Compassion	-0.38 ^a	0.04
Pride	-0.26	-0.36 ^a
Amusement	0.28 ^a	0.27 ^a

All values reflect standardized Beta (β) coefficients from block 2 of the regression model, controlling for respective symptom status at initial evaluation (T1) in block 1.

^a $p < 0.05$.

SUM-M = severity of manic symptoms; SUM-D = severity of depressive symptoms.

of the positive emotions. All predictors were z -transformed and all tolerance coefficients were above 0.50. The overall model for SUM-M was significant [$r^2_{\text{total}} = 0.46$, $F(5,38) = 5.72$, $p = 0.001$]. As shown in Table 2, joy and amusement predicted increased mania severity. Compassion, by contrast, predicted decreased mania severity at T2. Pride did not significantly predict mania severity. The overall model remained significant when the additional three emotions (awe, contentment, and love) were added [$r^2_{\text{total}} = 0.53$, $F(8, 38) = 4.14$, $p < 0.05$]. However, none of these three emotions predicted mania severity (p 's > 0.10).

For depression severity (SUM-D), bivariate correlations between the four positive emotions and SUM-D scores at T1 did not reveal any significant associations (p 's > 0.30). The hierarchical linear regression analysis indicated that the overall model was significant for SUM-D scores [$r^2_{\text{total}} = 0.58$, $F(5,36) = 8.53$, $p < 0.001$]. Specifically, amusement predicted increased, whereas pride predicted decreased, depression severity. Neither joy nor compassion significantly predicted depression severity (see Table 2). Once again, the overall model remained significant when the additional three emotions (awe, contentment, and love) were added [$r^2_{\text{total}} = 0.61$, $F(8,36) = 5.46$, $p < 0.001$]. However, none of these three emotions predicted depression severity (p 's > 0.20).

Discussion

The aim of the present study was to examine associations between BD and dispositional tendencies toward distinct positive emotions as well as how these emotional dispositions predict clinical course in BD. For the first study aim, contrary to hypotheses, BD participants did not report elevated joy and pride relative to NC participants. Rather, BD participants tended to report lower

trait joy and compassion relative to NC participants. BD and NC participants did not differ in trait pride or amusement. BD participants also reported lower trait love, awe, and contentment relative to NC participants.

Taking findings for decreased trait joy first, these results are inconsistent with prior work suggesting heightened levels of reward-focused emotions in BD (9, 25). Methodological differences may help to account for the divergent findings. For example, our project included a middle-aged as opposed to an undergraduate sample. Furthermore, a clinically diagnosed BD sample may have endured more social and occupational disruptions that may reduce opportunities for reward relative to a younger, undiagnosed college sample. Neurobiological changes related to illness progression over time might also account for less positive emotion even during euthymia as patients with BD age. Regarding the lack of group differences in trait pride, research by Cartensen (34) suggests that as one ages, one's emotions may become more other-oriented. With respect to decreased trait compassion, previous work documenting decreased compassion in an at-risk BD sample (9) is extended in the current study to a clinically diagnosed BD group. For amusement, although one might expect elevated trait amusement in the BD group, previous research to date has implicated elevated amusement-related behavior (joking, laughter) during the manic, but not interepisode, phase of BD (35).

For the second aim of our study, increases in mania symptom severity were predicted by trait joy and amusement, while trait compassion predicted subsequent decreases in severity of mania. These results are consistent with findings linking reward proneness to increases in mania symptom severity (36). Although amusement has been conceptually linked to creative thinking (23), an empirical question remains as to whether amusement may facilitate escalation into the grandiose or creative endeavors reported during periods of mania (27). The fact that compassion predicted decreased mania severity suggests it may be a potential protective factor. The tendency to attend to the needs of others experienced during compassion (13, 17) may predispose individuals to build strong, supportive networks which buffer against the onset of manic symptoms (37).

With respect to predictors of depressive symptom severity, trait amusement predicted increased depression severity. This finding is inconsistent with work in unipolar depression linking decreased responsivity to amusing stimuli with a decreased likelihood of recovering from a depressive episode

(38). The experience of amusement may play a different role in the course of bipolar versus unipolar depression. It is possible that in patients with BD, trait amusement could increase subsequent mood-elevation symptoms that in turn could yield subsequent depressive symptoms (e.g., postmania depression). The finding that trait pride predicted decreases in depressive symptoms is consistent with the fact that depression involves diminished self-esteem. Hence, increases in self-esteem associated with pride likely covary with decreases in depression.

Findings from the present study should be interpreted within the confines of several limitations. First, the sample sizes were modest, and due to attrition, particularly small for longitudinal analyses. Thus, there may not have been sufficient statistical power to reject null hypotheses. However, we note that post hoc analyses indicated that power was adequate (0.80) to detect medium effect sizes for baseline group comparisons (Cohen's $f = 0.31$). Nonetheless, it will be important to replicate these findings in a larger sample. Second, we recognize that our primary predictor variables rely exclusively on self-report measures. Future research should endeavor to use daily emotion diaries and physiological assessments of emotional functioning. Third, although we found no associations between our trait positive emotions and naturalistically administered medication status, future research with larger sample sizes and random assignment to different medication classes are warranted. Fourth, we did not include a comparison clinical group with known elevations in positive emotion and reward systems (e.g., pathological gambling, addiction) that would have enabled us to examine diagnostic specificity. Fifth, only two people actually relapsed into DSM-IV-TR syndromal mood episodes at follow-up. Longer prospective monitoring may be necessary to observe sufficient numbers of relapses to permit such statistical examination of clinical relapse. Relatedly, results pertaining to decreases in symptom severity should be interpreted with caution since BD participants began at a relatively asymptomatic baseline. Finally, generalizations to non-Caucasian and less affluent BD samples may be limited.

Despite these limitations, to our knowledge this is one of the first attempts to examine whether patients with BD are characterized by unique patterns of positive emotion dispositions and how these relate to clinical course. The present study suggested that recovered BD participants reported decreased reward-related emotions relative to NC participants. Interestingly, trait positive emotions

prospectively predict differential patterns of mania and depression symptom severity. More research is needed to understand how positive emotions change with the severity of the sample, duration of illness, and course of the disorder.

References

1. Coryell W, Scheftner W, Keller M, Endicott J, Maser J, Klerman GL. The enduring psychological consequences of mania and depression. *Am J Psychiatry* 1993; 150: 720–727.
2. Craighead WE, Miklowitz DJ, Frank E, Vajk FC. Psychosocial treatments for bipolar disorder. In: Nathan PE, Gorman JM ed. *A Guide to Treatments that Work*. New York: Oxford University Press, 2002: 263–275.
3. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text revision). Washington, DC: American Psychiatric Association, 2000.
4. Jamison KR *Exuberance: The Passion for Life*. New York: Brookes Publishing Company, 2005.
5. Johnson SL, Gruber J, Eisner L. Emotion and psychopathology: bridging affective and clinical science. In: Rottenberg J, Johnson SL ed. *Emotion and Bipolar Disorder*. Washington, D.C: American Psychological Association (APA) Books, 2007: 123–150.
6. Johnson SL, Ruggiero CJ, Carver CS. Cognitive, behavioral, and affective responses to reward: links with hypomanic symptoms. *J Soc Clin Psychol* 2005; 24: 894–906.
7. Meyer B, Johnson SL, Winters R. Responsiveness to threat and incentive in bipolar disorder: relations of the BIS/BAS scales with symptoms. *J Psychopathol Behav Assess* 2001; 23: 133–143.
8. Sutton SK, Johnson SL. Hypomanic tendencies predict lower startle magnitudes during pleasant pictures. *Psychophysiology* 2002; 39(Suppl.): S80.
9. Gruber J, Johnson SL, Oveis C, Keltner D. Risk for mania and positive emotional responding: too much of a good thing? *Emotion* 2008; 8: 23–33.
10. Lovejoy MC, Steuerwald BL. Subsyndromal unipolar and bipolar disorders: comparisons on positive and negative affect. *J Abnorm Psychol* 1995; 104: 381–384.
11. Fredrickson BL. What good are positive emotions? *Rev General Psychol* 1998; 2: 300–319.
12. Izard CE. *The Face of Emotion*. New York: Appleton-Century-Crofts, 1971.
13. Shiota MN, Keltner D, John OP. Positive emotion dispositions differentially associated with big five personality and attachment style. *J Posit Psychol* 2006; 1(2): 61–71.
14. Tugade MM, Fredrickson BL. Resilient individuals use positive emotions to bounce back from negative emotional experiences. *J Pers Soc Psychol* 2004; 86: 320–333.
15. Tracy JL, Robins RW. Show your pride: evidence for a discrete emotion expression. *Psychol Sci* 2004; 15: 194–197.
16. Gilbert P, McEwan K, Hay J, Irons C, Cheung M. Social rank and attachment in people with a bipolar disorder. *Clin Psychol Psychother* 2007; 14: 48–53.
17. Eisenberg N, Fabes RA, Miller PA et al. Relation of sympathy and distress to prosocial behavior: a multi-method study. *J Pers Soc Psychol* 1989; 57: 55–66.
18. Bowlby J *The Making and Breaking of Affectional Bonds*. London: Tavistock, 1979.

19. Hazan C, Shaver PR. Romantic love conceptualized as an attachment process. *J Pers Soc Psychol* 1987; 52: 511–524.
20. Ruch W. Exhilaration and humor. In: Lewis MJ, Haviland M ed. *The Handbook of Emotion*. New York: Guilford Publications, 1993: 605–616.
21. Lazarus RS. Goal congruent (positive) and problematic emotions. In: Lazarus RS ed. *Emotion and Adaptation*. New York: Oxford University Press, 1991: 264–296.
22. Latta RL. *The Basic Humor Process: A Cognitive-Shift Theory and the Case against Incongruity*. New York: Mouton de Gruyter, 1999.
23. Isen AM, Daubman KA, Nowicki GP. Positive affect facilitates creative problem solving. *J Pers Soc Psychol* 1987; 52: 1122–1131.
24. Keltner D, Haidt J. Approaching awe, a moral, spiritual, and aesthetic emotion. *Cogn Emot* 2003; 17: 297–314.
25. Gruber J, Johnson SL. Positive emotional traits and ambitious goals among people at risk for mania: the need for specificity. *Int J Cogn Ther*, in press.
26. Johnson SL. Mania and dysregulation in goal pursuit: a review. *Clin Psychol Rev* 2005; 25: 241–262.
27. Jamison KR. *Touched by Fire: Manic-Depressive Illness and the Artistic Temperament*. New York, NY: Free Press Paperbacks, 1993.
28. Grossman P, Niemann L, Schmidt S, Walach D. Mindfulness-based stress reduction and health benefits: a meta-analysis. *J Psychosom Res* 2004; 57: 35–43.
29. Sachs GS, Thase ME, Otto MW et al. Rationale, design, and methods of the systematic treatment enhancement program for bipolar disorder (STEP-BD). *Biol Psychiatry* 2003; 53: 1028–1042.
30. Sachs GS, Guille C, McMurrich SL. A clinical monitoring form for mood disorders. *Bipolar Disord* 2002; 4: 323–327.
31. Sheehan DV, Lucrubier YK, Harnett-Sheehan K et al. The Mini-International Neuropsychiatric Interview (MINI): the development and validation of a Structured Diagnostic Interview for ICD-10 and DSM-IV. *J Clin Psychiatry* 1998; 59(Suppl. 20): 22–23.
32. First MB, Spitzer RL, Gibbon M, Williams JBW. *Structured Clinical Interview for DSM-IV- Patient Version*. New York: Biometrics Research Department, New York State Psychiatric Institute, 1994.
33. Perlis R, Miyahara S, Marangell LB et al. Long-term implications of early onset in bipolar disorder: data from the first 1000 participants in the systematic treatment enhancement program for bipolar disorder (STEP-BD). *Biol Psychiatry* 2004; 55: 875–881.
34. Cartensen LL. Emotion and aging. In: G. Maddox G ed. *Encyclopedia of Aging*. New York: Springer Publishing Co, 2001: 327–329.
35. Bech P. The Bech-Rafaelsen Melancholia Scale: a 20-year review of its use as outcome measure. *Acta Psychiatr Scand* 2002; 106: 252–264.
36. Lozano B, Johnson SL. Can personality traits predict manic and depressive symptoms? *J Affect Disord* 2001; 63: 103–111.
37. Johnson SL, Winett CA, Meyer B, Greenhouse WJ, Miller I. Social support and the course of bipolar disorder. *J Abnorm Psychol* 1999; 108: 558–566.
38. Rottenberg J, Kasch KL, Gross JJ, Gotlib IH. Sadness and amusement reactivity differentially predict concurrent and prospective functioning in major depressive disorder. *Emotion* 2002; 2: 135–146.