



Ruminative and dampening responses to positive affect in bipolar disorder and major depressive disorder

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ABSTRACT

Background: Although previous research has focused on distinguishing cognitive styles between Bipolar Disorder (BD) and Major Depressive Disorder (MDD), little is known about differences in positive affect regulation between these affective groups. The aim of the present study was to extend previous research by investigating such differences between BD and MDD, and between the bipolar subtypes (BD-I vs. BD-II and predominant polarities), using large, clinical, outpatient samples.

Methods: In total, 298 participants (96 BD-I, 27 BD-II, and 175 MDD) were included. All completed the Responses to Positive Affect (RPA) questionnaire. Mood symptoms in BD patients were clinically assessed by means of the Clinical Global Impression for Bipolar Disorders (CGI-BP), while depressive symptom severity in MDD patients were assessed by means of the Inventory of Depressive Symptomatology (IDS-SR).

Results: Results showed differences between affective groups and bipolar subtypes. The most salient finding was that both BD-I and BD-II patients were more likely to ruminate about positive affect than MDD patients, while MDD patients were more likely to engage in dampening responses to positive affect.

Conclusions: Differentiation of responses to positive affect between BD and MDD may have relevant clinical implications in terms of symptomatology, course, and treatment.

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1. Introduction

Bipolar Disorder (BD) is a disabling and lifelong condition characterized by recurrent manic, hypomanic and depressive episodes, with an estimated 12-month prevalence of 0.8–1.8%, and a life-time prevalence of 1.3–2.5% [1–3]. Although BD is primarily positioned as a biological disorder, with mood stabilizing medication as the first-line treatment, there is increasing recognition of psychological factors affecting the illness course of BD [4–6]. Accumulating evidence associates BD with difficulties in affect regulation, contributing to the onset and maintenance of mood symptoms [7, 8]. Most research is still directed at negative affect regulation, although there is increasing recognition for the role of positive affect regulation in psychopathology [9–12]. Feldman, Joormann [9] differentiate three processes related to positive affect regulation: dampening (i.e. the tendency to actively decrease positive feelings), and two positive rumination strategies: emotion-focused rumination (i.e. repetitively focusing on current positive states) and self-focused rumination (i.e. repetitively focusing on positive self-qualities). Several studies have found significant correlations between

the way people respond to positive affect and the presence of (hypo) manic and depressive symptoms. For example, in college students, dampening of positive affect has been found to be predictive of depressive symptoms [9, 11, 13], while rumination on positive affect has been found to be correlated with (hypo)manic symptoms [9, 11, 14]. People with BD have been shown to be more likely to engage in both dampening and ruminative responses to positive affect than healthy controls [6, 8, 15].

Guidelines emphasize the use of Cognitive Behavioral Therapy (CBT) as one of the psychological interventions in the treatment of BD in addition to psycho-education [16–19]. CBT interventions for BD are largely drawn from CBT interventions for Major Depressive Disorder [MDD; 20]. However, less improvement of mood symptoms is generally observed in BD following CBT. Amongst others, one explanation for this finding might be that the use of CBT in BD is more complex than in MDD and, therefore, might require a higher level of therapist expertise [20, 21]. For example, when bipolar patients experience racing thoughts as part of a (hypo) manic episode, is it possible they will forget plans that were made during sessions. Therefore, it might be harder for therapists to break through the spiraling circle of thoughts, feelings, and behavior [22]. To improve CBT for BD, it is important to distinguish differences in positive affect regulation between BD and MDD [15]. Only a few studies have addressed this issue. In relatively small, undergraduate samples ($n = 28$ BD, $n = 35$ MDD), Johnson, McKenzie [6] showed that BD patients engaged in significantly

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more emotion-focused rumination than MDD patients. Another small study amongst 62 remitted patients, including 31 patients diagnosed with BD and 31 diagnosed with MDD, found no significant differences between BD and MDD regarding responses to positive affect [23]. A third study, limited by the reliance on undergraduate samples, also showed no significant differences in responses to positive affect between BD and MDD patients [15]. To our knowledge, only one study investigated differences in positive affect regulation in a relatively large, clinical sample of 208 BD patients and 114 MDD patients [4]. That study showed that BD patients engaged in significantly more emotion-focused and self-focused rumination in response to positive affect than MDD patients. No significant differences on dampening responses to positive affect were found.

The studies described above, with an exception of the study of Fletcher, Parker [4], did not differentiate between the two most distinctive bipolar subtypes; BD type I (BD-I) and BD type II (BD-II). BD-I is characterized by both depressive and severe manic episodes, while BD-II is characterized by both depressive and less severe hypomanic episodes [24]. However, differences in symptoms and illness course between these bipolar subtypes cannot be ignored [25] and examination of differences in positive affect regulation between BD-I and BD-II might be of interest to inform development and refinement of psychological models and interventions for BD. Fletcher, Parker [4] did not find any significant differences between the bipolar subtypes in terms of responses to positive affect. Another issue that warrants further scrutiny is the association of positive affect regulation and predominant depressive or (hypo)manic polarities. Colom, Vieta [26] propose that depressive polarity is defined when at least two-thirds of past episodes fulfill the criteria of depressive episodes, while (hypo)manic polarity is defined when at least two-thirds of past episodes fulfill the criteria of (hypo)manic episodes. No predominant polarity is defined when the criteria of either a depressive or (hypo)manic polarity are not fulfilled. Depressive polarity appears to be more prevalent amongst BD-II patients, while (hypo)manic polarity seems to be more prevalent amongst BD-I patients [26–28]. These differences in illness course might be associated with the use of differential positive affect regulation strategies. Indeed, Gruber, Eidelman [8] found a significant positive association between the frequency of manic episodes and dampening and ruminative responses to positive affect, while the frequency of depressive episodes was only positively associated with ruminative responses to positive affect. However, to date, no study investigated differences in the use of positive affect regulation strategies between clearly distinguished predominant polarity groups.

The aim of the present study was to extend previous research by investigating differences in positive affect regulation strategies between affective groups (BD vs. MDD), and between the bipolar subtypes (BD-I vs. BD-II and predominant polarities), using large, clinical, outpatient samples. First, it was hypothesized that BD patients would report less dampening and more ruminative responses to positive affect compared to MDD patients. Second, it was expected that BD-I patients engage in more positive rumination and less dampening than BD-II patients. Third, it was hypothesized that BD patients with predominant depressive or (hypo)manic polarities are more likely to engage in more dampening and ruminative responses to positive affect compared to BD patients without a predominant polarity. Finally, it was hypothesized that dampening is associated with greater depressive symptom severity, while positive rumination is correlated with more (hypo)manic symptom severity.

2. Method

2.1. Participants

Participants were 123 patients diagnosed with BD (96 BD-I, 27 BD-II) and 175 patients diagnosed with MDD, recruited from a specialized outpatient clinic for BD and a specialized outpatient clinic for MDD,

both part of Altrecht Institute for Mental Health Care in the Netherlands. BD patients were approached during their scheduled appointments, while data from MDD patients was collected as part of the regular intake procedure. Patients (aged 18+ years) were eligible to participate if they had received a prior diagnosis of a mood disorder (BD-I, BD-II, or MDD) from a clinical practitioner (psychiatrist or psychologist) based on semi-structured clinical interviews. Exclusion criteria were current psychosis, neurological disorders, severe suicidality, poor Dutch comprehension, and severe alcohol and/or substance abuse.

2.2. Measures

2.2.1. Clinical Global Impression - Bipolar [CGI-BP; 29] (Dutch translation, Altrecht 2004)

The CGI-BP is a modified version of the CGI to assess the severity of mania, depression, and overall illness severity in the past week. In the present study, clinicians were asked to rate either the depressive or (hypo)manic subscale, depending on the current mood status of the participants. Quantification of the depressive and (hypo)manic symptoms occurred at a 7-point scale, from 1 = no display of symptoms to 7 = extreme display of symptoms. The current mood status of patients was designated as stable with a CGI-BP score of one. The current mood status of patients was designated as depressed or (hypo)manic when the CGI-BP score was two or higher (2–3 = mild, 4–5 = moderate, and 6–7 = severe) on the depressive subscale or the (hypo)manic subscale, respectively. The inter-rater reliability of the CGI-BP has been shown excellent on both the depression ($\alpha = 0.92$) and mania (no variability) subscales [29].

2.2.2. Inventory of Depressive Symptomatology - Self-report [IDS-SR; 30]

By means of the IDS-SR, the severity of depressive symptoms in MDD patients was determined. The IDS-SR is a 30-item, self-report measure of depressive symptoms, with total score ranges from 0 to 84 (<13 = not depressed, 14–25 = mild, 26–38 = moderate, 39–48 = marked, and 49 ≥ severe depression). Psychometric properties of the IDS-SR have been found to be adequate [30]. In the present study, the Chronbach alpha coefficient was 0.86.

2.2.3. Responses to positive affect questionnaire - Dutch version [RPA-NL; 9]

The RPA-NL is a 17-item self-report questionnaire tapping responses to positive affective states. Responses are rated on 4-point scales (ranging from 1 = almost never to 4 = almost always). The questionnaire consists of three subscales, including Dampening (e.g. “My streak of luck is going to end soon”), Self-focused positive rumination (e.g. “It makes me think I am achieving a lot in my life”), and Emotion-focused positive rumination (e.g. “I feel full of energy”). Psychometric properties of the English [9] and Dutch version [14] are adequate. The present study found a good internal consistency for each of the subscales of the RPA-NL as well, with Chronbach's alphas of 0.83, 0.85, and 0.82 for dampening, self-focused rumination, and emotion-focused rumination, respectively.

2.2.4. Study - specific questionnaire

The illness course of BD patients was determined using a self-report questionnaire specifically designed for the present study. This questionnaire recorded age of onset of mood episodes, polarity of onset, life-time number of depressive, (hypo)manic, and mixed episodes, as well as use of alcohol and/or drugs.

2.3. Procedure

The study was approved by the Research Committee of Altrecht, Institute for Mental Health Care (CWO_{nr} = 1621). Eligibility of BD patients for participation in the current study was determined by their clinicians, who had diagnosed them with either BD-I or BD-II. Eligible

BD patients who agreed to participate were provided with a description of the study, after which written consent was obtained. Next, BD patients completed the questionnaire on demographic information and mood disorder history, and the RPA-NL. In the meantime, the clinicians were asked to quantify the patients' current mood status by means of the CGI-BP. Information about BD patients' mood disorder history was used to determine their predominant polarity. We used a strict, more time-stable definition of polarity, as proposed by Colom, Vieta [26]. Specifically, depressive polarity was defined when at least two-thirds of past episodes fulfill the criteria of depressive episodes, while (hypo) manic polarity was defined when at least two-thirds of past episodes fulfill the criteria of (hypo)manic episodes. BD patients were categorized as having no predominant polarity when they did not fulfill the criteria of either a depressive or (hypo)manic polarity. Mixed episodes were not included in this definition.

Eligibility of MDD patients was determined by their clinicians during the intake procedure. As part of the regular intake procedure, MDD patients were invited to complete several questionnaires, including questions about demographic information and mood disorder history, and the RPA-NL. Current mood status of MDD patients was assessed via the IDS-SR. Only data of MDD patients who had signed informed consent were available for the present study.

2.4. Statistical analyses

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 22.0 [31]. Assumptions were checked and violations were handled in accord with conventional guidelines. Outliers outside the 1.5 interquartile range were replaced by the highest or lowest non-deviating scores. In the BD sample, five outliers were found in the life-time depressive episodes and three outliers were found in the life-time manic episodes. For some participants, item 12 of the RPA was missing due to a printing error. In that case, missing items were replaced by the mean of the corresponding scale of that specific participant.

The three samples (i.e. BD-I, BD-II, and MDD) were compared on socio-demographic and clinical variables using analyses of variance (ANOVAs), and chi-square statistic for categorical dependent variables. ANOVAs were used to examine differences in responses to positive affect between groups, with two planned contrasts (contrast 1 = BD vs. MDD, and contrast 2 = BD-I vs. BD-II). ANOVAs were also used to examine differences in responses to positive affect between predominant polarities in the BD sample, with three planned groups (1 = depressive polarity; 2 = (hypo)manic polarity; 3 = no predominant polarity). When significant main effects were found, Tukey post-hoc comparisons were conducted. Pearson correlations were calculated to determine associations between responses to positive affect and severity of current mood symptoms.

3. Results

3.1. Demographic variables

Demographic and clinical variables of participants are shown in Table 1. The total sample consisted of 298 patients (96 BD-I, 27 BD-II, and 175 MDD), with a slight over-representation of females (55.7%). Affective groups significantly differed on age, with a mean age of 43.97 (SD = 12.77), 42.37 (SD = 10.73), and 40.06 (SD = 10.15) years old in the BD-I, BD-II, and MDD groups, respectively. Age of onset between affective groups were comparable and no statistically significant differences between the bipolar-subgroups regarding life-time number of episodes were found ($ps > .05$). Furthermore, no differences were found between the proportion of bipolar-subgroups currently taking mood stabilizing medication.

Based on IDS-SR scores, 4 MDD patients did not report depressive symptoms, 10 MDD patients were mildly depressed, and 40, 44, and 80 MDD patients were moderately, marked, and severely depressed, respectively (see Trivedi, Rush [30] for reference groups). Based on CGI-BP scores, 45 BD patients did not report any mood symptoms, while 13, 23, 14, and 4 BD patients were mildly, moderately, marked, and severely depressed, respectively. As for (hypo)manic symptoms, 9 BD patients were mildly (hypo)manic, and 5, 1, and 1 BD patients were moderately, marked, and severely (hypo)manic, respectively (see Spearing, Post [29] for reference groups).

Table 2 shows demographic and clinical variables of BD patients, divided into groups by their predominant polarity. In total, 34 (29.6%) BD patients were classified with depressive polarity, and 33 (28.7%) with (hypo)manic polarity. No predominant polarity was found in 40.9% ($n = 48$) of BD patients. (Hypo)manic polarity was more prevalent amongst BD-I patients and was strongly associated with manic onset of BD, while depressive polarity was strongly associated with depressive onset of BD.

3.2. Group differences in responses to positive affect

Differences in responses to positive affect between BD-I, BD-II, and MDD are shown in Table 3. As hypothesized, MDD patients were significantly more likely to engage in dampening responses to positive affect compared to BD-I patients ($p < .001$). A smaller, but significant difference regarding dampening responses to positive affect between MDD and BD-II patients was found ($p < .05$). Contrasts between BD patients showed that BD-II patients were more likely to engage in dampening compared to BD-I patients ($p < .05$). Furthermore, as hypothesized, results indicated that both BD-I and BD-II patients were significantly more likely than MDD patients to engage in positive rumination ($ps < .001$). Unexpectedly, no significant differences in

Table 1
Demographic and clinical characteristics of patients with bipolar disorder (BD) type I (BD-I) and type II (BD-II) and patients with Major Depressive Disorder (MDD).

	BD-I ($n = 96$) Mean (SD)	BD-II ($n = 27$) Mean (SD)	MDD ($n = 175$) Mean (SD)	F-value
Age	43.97 (12.52)	42.37 (10.73)	40.06 (10.15)	3.916*
Age of onset	28.88 (10.61)	24.67 (9.91)	28.78 (13.98)	1.341
Life-time number of episodes				
Depressed	5.05 (7.56)	8.04 (5.90)	- ¹	3.356
(Hypo)manic	4.74 (4.81)	4.80 (4.14)	-	0.036
Mixed	0.77 (1.56)	1.12 (1.72)	-	0.964
	N (%)	N (%)	N (%)	Chi-Square
Gender				0.017
Female	54 (43.9)	15 (55.6)	97 (55.4)	
Male	42 (34.1)	12 (44.4)	78 (44.6)	
Currently taking mood stabilizing medication	87 (90.6)	25 (92.6)	-	0.100

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

¹ Data of life-time number of episodes in the MDD-sample were not available.

Table 2
Demographic and clinical characteristics between predominant polarities in BD patients.

	Depressive polarity (n = 34) N (%)	(Hypo)Manic polarity (n = 33) N (%)	No polarity (n = 48) N (%)	Chi-Square
Subtype				9.755*
BD-I	21 (23.9)	31 (35.2)	36 (40.9)	
BD-II	13 (48.1)	2 (7.4)	12 (44.4)	
Gender				0.541
Female	21 (32.3)	18 (27.7)	26 (40.0)	
Male	13 (26.0)	15 (30.0)	22 (44.0)	
Onset				41.571***
Depressive	28 (82.4)	2 (6.1)	28 (58.3)	
(Hypo)manic	5 (14.7)	28 (84.8)	17 (35.4)	
Mixed	1 (2.9)	3 (9.1)	3 (6.3)	
	Mean (SD)	Mean (SD)	Mean (SD)	
Life-time number of episodes				
Depressed	8.18 (8.23)	0.97 (1.45)	8.98 (16.24)	5.409**
(Hypo)manic	2.71 (2.53)	4.27 (2.92)	8.36 (16.02)	3.156*
Mixed	0.94 (1.69)	1.21 (3.63)	1.00 (2.65)	0.097

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

ruminative responses to positive affect were found between the bipolar-subgroups.

Table 4 shows differences in responses to positive affect between the predominant polarities. BD patients with (hypo)manic polarity were significantly less likely to engage in dampening responses compared to BD patients with no predominant polarity ($p = .002$). No other significant differences were found between predominant polarities and dampening or ruminative responses to positive affect ($ps > .30$).

3.3. Associations between current mood symptoms and responses to positive affect

Table 5 shows the associations between current mood symptoms and responses to positive affect. A small, but significant positive association between current mood symptoms and emotion-focused rumination in BD-I patients was found ($p = .048$), indicating that, in BD-I patients, more severe manic mood symptoms coincided with stronger inclination to engage in emotion-focused ruminative responses to positive affect. No further significant associations between current mood symptoms and responses to positive affect in BD patients were found ($ps > .250$). As for MDD patients, the severity of the depressive symptoms were significantly positively associated with dampening and inversely related with self-focused and emotion-focused rumination ($ps < .01$).

4. Discussion

The aim of the present study was to extend previous research by investigating differences in positive affect regulation between affective groups (BD vs. MDD) and bipolar subtypes (BD-I vs. BD-II and predominant

polarities) in clinical samples. Hypotheses were largely supported by study results, as discussed below.

First, it was hypothesized that BD patients would report less dampening and more ruminative responses to positive affect compared to MDD patients. Results were consistent with this prediction, showing that BD patients engaged in more ruminative responses to positive affect, while MDD patients engaged in more dampening responses to positive affect. These findings partially replicate or are in contrast with prior work, where either no differences between affective groups in dampening responses [4, 6] or no differences in both ruminative and dampening responses to positive affect [15, 23] were found. However, the findings are conceptually consistent as differences between BD and MDD would be expected based on studies showing that elevated ruminative responses to positive affect have been correlated to (hypo) manic symptoms [9, 11, 14], while dampening responses to positive affect have been correlated to depressive symptoms [9, 11, 13, 32].

Second, it was hypothesized that BD-I patients engage in more positive rumination and less dampening than BD-II patients. Results partially supported this hypothesis, showing that BD-II patients engaged in more dampening responses to positive affect compared to BD-I patients. Due to the cross-sectional design of this study it remains unclear whether BD-II patients engage in more dampening responses because of their vulnerability to depressive polarity [26, 28], or whether the use of more dampening strategies to positive affect makes BD-II patients more receptive for the occurrence of depression (i.e. illness scarring effects) [4]. Against expectations, results showed no differences in the use of either emotion- or self-focused positive rumination strategies between the bipolar subtypes. One explanation of this finding is that BD-I patients are more familiar with strategies to prevent an ascent into mania, such as self-calming strategies, using a crisis prevention action plan, and challenging maladaptive cognitive styles about positive mood, e.g. actively suppressing positive rumination [9, 33, 34].

Third, it was hypothesized that BD patients with predominant depressive or (hypo)manic polarities are more likely to engage in respectively more dampening and ruminative responses to positive affect compared to BD patients without a predominant polarity. Against expectations, it was found that BD patients without a predominant polarity significantly engage in more dampening responses to positive affect compared to BD patients with (hypo)manic polarity. No further differences in dampening and ruminative responses to positive affect between distinct polarity groups were found. The lack of significance might be explained by the use of the strict, more time-stable definition of polarity [35], inducing small sample sizes ($n = 34$ depressive polarity, $n = 33$ (hypo)manic polarity).

Finally, it was hypothesized that dampening of positive affect is associated with greater depressive symptom severity, while positive rumination is correlated with greater (hypo)manic severity. Results were partially consistent with this prediction. With increasing severity of depressive symptoms, MDD patients engaged in more dampening and less ruminative responses to positive affect. This finding is congruent with the study of Treynor, Gonzalez [36] that showed that rumination in response to negative affect was correlated with more concurrent depression. Furthermore, this finding accord with the notion that maladaptive regulation of positive affect contributes to the accordance of depressive symptoms, which supports prior work showing that

Table 3
Differential scores of responses to positive affect between affective groups.¹

	BD-I (N = 96) Mean (SD)	BD-II (N = 27) Mean (SD)	MDD (N = 175) Mean (SD)	F-value	Contrast 1: BD-I vs BD-II F-value (df)	Contrast 2: BD-I vs MDD F-value (df)	Contrast 3: BD-II vs MDD F-value (df)
RPA Dampening	13.70 (3.73)	15.32 (3.61)	17.36 (5.04)	20.512***	4.190* (1,43)	46.267*** (1246)	6.662* (1,43)
RPA Rumination self-focused	8.65 (2.66)	8.78 (2.81)	7.23 (3.15)	8.605***	0.040 (1295)	14.168*** (1295)	6.350* (1295)
RPA Rumination emotion-focused	13.13 (2.71)	12.93 (2.69)	10.52 (3.45)	23.803***	0.121 (1,42)	47.252*** (1225)	1,17.256*** (1,40)

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

¹ Results are displayed without including age as a covariate, since this had no effect on significance levels.

Table 4
Differential scores of responses to positive affect between predominant polarities in BD patients; depressive polarity (DP), (hypo)manic polarity (MP), no polarity (NP).

	DP (N = 34) Mean (SD)	MP (N = 33) Mean (SD)	NP (N = 48) Mean (SD)	F-value	Contrast 1: DP vs MP F-value (df)	Contrast 2: DP vs NP F-value (df)	Contrast 3: MP vs NP F-value (df)
RPA Dampening	14.18 (3.34)	12.93 (3.95)	15.02 (3.83)	3.084*	−1.88 (1112)	1.020 (1112)	6.170* (1112)
RPA Rumination self-focused	8.74 (2.45)	8.30 (2.48)	8.92 (3.11)	0.500	−0.412 (1112)	0.092 (1112)	0.988 (1112)
RPA Rumination emotion-focused	13.38 (2.45)	13.15 (2.66)	12.59 (2.89)	0.936	−0.123 (1112)	−1.700 (1112)	0.835 (1112)

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

dysfunctional emotion regulation strategies to negative affect predict the onset and maintenance of depression [9, 37, 38]. In the BD sample, it was found that BD-I patients engaged in more emotion-focused rumination to positive affect with increasing manic symptoms, replicating prior work [6, 15]. No other statistically significant associations between depressive and (hypo)manic symptoms and dampening or ruminative responses to positive affect were found in BD patients. Therefore, it remains unclear whether increasing symptom severity in BD patients is associated with a differential use of responses to positive affect. This lack of significant findings in the BD sample could be explained by the distribution regarding severity of mood symptoms. Data of MDD patients was collected as part of their regular intake process. Therefore, most MDD patients included in the present study did not receive psychological or pharmacological interventions yet, resulting in many moderate to severely depressed MDD patients. On the other hand, BD patients participating in the present study were approached during their scheduled appointments, while already receiving psychological or pharmacological interventions, resulting in less severe symptomatology. We had no information about the prior treatment history of BD patients and were, therefore, not able to examine whether there is an association between prior pharmacological and/or psychological interventions and the use of responses to positive affect. It might be interesting for future studies to investigate the relation between treatment history and ruminative and dampening responses to positive affect.

Altogether, our findings indicate that there are differences between the MDD and BD groups in responses to positive affect, with the most important findings being that BD patients engage in more positive rumination and MDD patients in more dampening responses to positive affect. However, due to the cross-sectional design of this study it cannot be explained whether these differences between affective groups in responses to positive affect are state- or trait-dependent. Considering the Behavioral Approach System (BAS) hypersensitivity model of BD, it could be speculated that the use of maladaptive coping strategies in BD patients might be trait-dependent. The BAS is considered to be a psychobiological system that regulates approach motivation, goal-directed behavior and responsiveness to rewards [39, 40]. Several studies have shown that BD patients have a hyper-sensitive BAS when compared to healthy controls, indicating that an excessive activation of BAS may result in (hypo)mania while deactivation of BAS may result in depression [39, 41]. Deactivation of BAS can be triggered by events resulting in failure, while activation of BAS is triggered by goal striving events [42]. The study of Carver and Johnson [43] showed that goal striving and ruminative responses to positive affect are related tendencies toward mania while threat sensitivity and dampening of positive affect are related to tendencies toward depression. The study of Stange, Shapero [44] shows that individuals at risk for BD (i.e. individuals

with a hyper-sensitive BAS), exhibit greater levels of ruminative responses to positive affect as well, implying that the use of these strategies are not simply mood-dependent. However, longitudinal studies are needed to examine whether the dampening and ruminative responses to positive affect in BD patients can be seen as a trait, or as a fluctuating maladaptive coping strategy responding to mood symptoms.

The present results should be considered taking into account several limitations. First, a cross-sectional design was used, disallowing the present study to provide evidence for disentangling the relationship between responses to positive affect and the occurrence of mood symptoms or predominant polarities over time. Second, the study was limited by asking BD patients retrospectively about the number of lifetime depressive or (hypo)manic episodes. Therefore, the attribution of BD patients to their predominant polarities might have been compromised by memory bias. Third, different instruments were used to quantify current mood status in the BD (CGI-BP) and MDD (IDS-SR) samples. Although both instruments have adequate psychometric properties [29, 30] and, therefore, yield reliable information, the use of different instruments limits the comparability of findings between samples. Fourth, a limitation of the CGI-BP is that its total score range is limited to only 7, while other instruments use a broader score range, as a result of which indication of depressive and (hypo)manic symptom severity might be less representative. Fifth, the present study did not include an instrument to measure responses to negative affect. It might be of interest for future studies to compare differences in responses to positive and negative affect between BD and MDD.

5. Conclusions

Despite the mentioned limitations, results confirm and extend prior work of responses to positive affect between affective disorders. The present study shows differences between affective groups in responses to positive affect, implying that MDD patients engage in more dampening responses, while BD patients engage in more ruminative responses to positive affect. This supports the notion that interventions for MDD that are used to treat BD, such as cognitive behavioral interventions focused at relieving depressive symptoms, might not be as effective in BD patients as shown in MDD patients [15, 20, 21]. Instead, targeted treatments for BD should focus on awareness and restructuring of the maladaptive cognitive styles about positive mood states and fostering more acceptance-based forms of positive emotion regulation, such as mindfulness-based approaches to break through the spiraling cycle of positive ruminative thinking, and (hypo)manic behavior and symptoms. Mindfulness-Based Cognitive Therapy (MBCT) is a fairly recent addition to the range of psychological interventions to treat BD [45]. MBCT aims at developing a non-judgmental awareness at distressing thoughts, feelings, and sensations, without trying to take countermeasures to change them [46]. As a result, training in mindfulness should decrease the chance of getting caught in a vicious cycle of ruminative thinking. MBCT has been found promising in lowering residual depressive symptom, reducing negative rumination, increasing positive affect, increasing emotion-regulation abilities, and improving cognitive abilities such as executive and memory in BD patients [45, 47–50].

Table 5
Associations between current mood symptoms and responses to positive affect.

	Bipolar		MDD
	BD-I (n = 96)	BD-II (n = 27)	(n = 175)
RPA Dampening	0.003	−0.294	0.363***
RPA Rumination self-focused	0.000	0.217	−0.148*
RPA Rumination emotion-focused	0.203*	0.080	−0.288**

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

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Declarations of interest

None.

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