Positive Affect Regulation and Bipolar Disorder: an explorative study in an outpatient sample

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Abstract: bipolar disorder is characterized by the changing of emotional states and the difficulty of treatment. There is preliminary evidence that individuals who have experienced depression use more dysfunctional strategies and less functional strategies to manage their emotions than individuals who have never been depressed. Investigating the role of affect regulation strategies in bipolar disorder can be helpful for enhancing knowledge about psychological mechanisms that should be targeted in treatment. This is the first study about positive affect regulation in an outpatient bipolar sample. Comparisons were made between bipolar disorder and major depressive disorder. Data was also compared for gender and diagnosis. Outpatient bipolar patients completed the Response to Positive Affect questionnaire and current mood was determined by their specialist according to the Clinical Global Impression for bipolar disorders. Patients with a major depressive disorder completed the Response to Positive Affect questionnaire and the Inventory of Depressive Symptomatology. Current study shows that positive affect regulation does not correlate with mood severity in bipolar disorder. In major depressive disorder there is a clear positive relation between dampening and depression severity and a negative relation between positive rumination and depression severity. No difference were found between bipolar women and men for positive affect regulation. For diagnosis, patients with bipolar II disorder use more dampening than individuals with bipolar I disorder. Further longitudinal research should examine the relation between mood and positive affect regulation over time.

Keywords: Bipolar disorder; Depression; Mania; Dampening; Rumination; Positive affect; Emotion regulation

Samenvatting: de bipolaire stoornis wordt gekenmerkt door het wisselen van stemming en is moeilijk te behandelen. Er is preliminair bewijs dat individuen die een depressieve episode hebben doorgemaakt, meer dysfunctionele strategieën gebruiken om hun emoties te reguleren dan individuen die nooit depressief zijn geweest. Door de rol van affect regulatie strategieën in de bipolaire stoornis te onderzoeken, kunnen we meer kennis krijgen over psychologische mechanismen die aangepakt kunnen worden tijdens behandeling. Dit is het eerste onderzoek gericht op positieve affect regulatie bij poliklinische patiënten met een bipolaire stoornis. Er werden vergelijkingen gemaakt tussen de bipolaire stoornis en de unipolaire depressie. Ook werd gekeken naar verschillen in geslacht en diagnose. De bipolaire patiënten vulden de Response to Positive Affect questionnaire in en de huidige stemming werd bepaald door hun behandelaar volgens de Clinical Global Impression Bipolar. Patiënten met een unipolaire depressie vulden zowel de Response to Positive Affect questionnaire als de Inventory of Depressive Symptomatology in. Huidig onderzoek laat zien dat er geen verband is tussen positieve affect regulatie en de intensiteit van een stemmingsepisode bij de bipolaire stoornis. Bij patiënten met een unipolaire depressie is een duidelijke positieve relatie gevonden tussen het onderdrukken van positieve emoties en de ernst van een stemmingsepisode. Daarnaast is sprake van een negatieve relatie tussen het rumineren over positieve emoties en de ernst van een stemmingsepisode. Er zijn geen verschillen gevonden tussen bipolaire mannen en vrouwen met betrekking tot positieve affect regulatie. Gericht op diagnose, zijn patiënten met een bipolaire II stoornis eerder geneigd positieve emoties te onderdrukken dan patiënten met een bipolaire I stoornis. Verder longitudinaal onderzoek zal meer informatie geven over de relatie tussen stemming en positieve affect regulatie over tijd.

Kernwoorden: Bipolaire stoornis; Depressie; Positieve affect regulatie; Emotie regulatie; Manie; Rumineren

1. Introduction

The onset and maintenance of emotional disorders, like major depressive disorder (MDD) and bipolar disorder (BD), are more strongly linked to the way people react to their affective state than the affective state itself (Nolen-Hoeksema, 1991; Teasdale & Dent, 1987). There is preliminary evidence that individuals who have experienced depression use more dysfunctional strategies and less functional strategies to manage their emotions than individuals who have never been depressed (Ehring, Tuschen-Caffier, Schnülle, Fischer, & Gross, 2010). The role of affect regulation strategies in BD is a relevant topic for further research. BD is characterized by disrupted emotional functioning, including depressive and manic episodes (American Psychiatric Association, 2000). It is a psychiatric disorder that is hard to treat, with medication as first choice treatment. Psychological treatment focusses primarily on acceptance and strategies to prevent or weaken the episodes. Because of the changing of emotion states in BD and the difficulty of treatment, it can be helpful to investigate the role of affect regulation

strategies. In order to enhance knowledge about psychological mechanisms that should be targeted in treatment, it is important to know more about these mechanisms.

Affect regulation has been described by Gross (1998) as the processes by which individuals influence their emotions; whichever they have and when they have them, and how they experience and express their emotions. Affect regulation can be focused on both positive affect (PA) and negative affect (NA). Affect regulation has a significant influence on major themes in life, like social relationships and mental health (Gross, 1998).

The main focus of research has been on one side of the emotional spectrum, the negative affect. A lot of evidence has been conducted on the effects of the regulation of NA. For example rumination, a NA strategy, is associated with an increase of depressive symptoms (Green et al., 2011; Van Gucht, Morriss, Lancaster, Kinderman, & Bentall, 2009). This strategy is more frequently used by bipolar and depressive patients compared to healthy controls (Green et al., 2011; Johnson, McKenzie, & McMurrich, 2008).

However little research has been conducted focusing on the regulation of positive affect. There is a rise in attention for this over-sighted aspect and recent studies have shown that PA regulation plays an important role in the onset and course of emotional disorders (Fletcher, Parker, & Manicavasagar, 2013; Gruber, Eidelman, Johnson, Smith, & Harvey, 2011), possibly even more than the regulation of NA. Raes and colleagues (2012) found that the significant effects of brooding, a negative affect strategy, on depressive symptoms disappeared when PA regulation was taken into account (Raes, Smets, Nelis, & Schoofs, 2012).

PA regulation can be categorized into at least three strategies; dampening and two elements of positive rumination; self-focused and emotion-focused. Dampening is the suppression of positive emotions and events, reflected in statements such as: ‘I do not deserve this, this is too good to be true’. Positive rumination is repeatedly thinking about positive achievements or feelings (Feldman, Joormann, & Johnson, 2008). This can focused on the positive meaning of the event, one’s confidence or sense of self: ‘I can achieve anything I want’ (self-focused positive rumination). Additionally, positive rumination can be emotion-focused, focused on the affective sensations: ‘I feel strong’. So far there has been minimal research on PA regulation. The results from different studies looking at positive affect regulation in mood disorders are described in Table 1.

Table 1: *Studies on positive affect regulation and mood disorder*

Authors (year)	Sample	Method	Results
Henriques & Davidson (2000)	MDD patients	Memory task with three conditions: neutral, punishment and reward. MDD compared to healthy controls.	Participants with MDD show more dampening.
Rottenberg et al. (2002)	MDD patients	Fragments that display different emotions. MDD compared to healthy controls.	Participants with MDD show more dampening. More dampening was associated with slow recovery from depression.
Feldman et al. (2008)	Students	Self-report measure of positive affect regulation, current depressive and manic symptoms and manic sensitivity.	Depressive symptoms are related to dampening. Manic symptoms are related to self-focus positive rumination. Manic sensitivity is related to dampening and positive rumination.
Johnson et al. (2008)	Students with BD or MDD	Self-report measure of affect regulation, current depressive and manic symptoms and manic sensitivity.	Participants with BD show more positive and negative rumination compared to healthy controls. Participants with MDD show more negative rumination compared to the BD group.
Johnson & Jones (2009)	Students	Self-report measure of positive affect regulation, impulsivity and manic vulnerability.	Manic symptoms are related to positive rumination, impulsivity and being overly confident after success.
Raes et al. (2009)	Students	Self-report measure of affect regulation, current depressive symptoms and manic sensitivity.	Depressive symptoms are related to dampening. Depressive symptoms are negatively related to positive rumination. Manic sensitivity is related with positive rumination, especially self-focused positive rumination.
Verstraeten et al. (2012)	Children 9 – 12 years	Self-report measure of positive affect regulation, current depressive and manic symptoms.	Depressive symptoms are related to dampening. Manic symptoms are related to dampening and positive rumination.

Research shows that dampening of PA is related to depressive symptoms (Feldman et al., 2008; Henriques & Davidson, 2000; Raes, Daems, Feldman, Johnsons, & Van Gucht, 2009; Rottenberg, Kasch, Gross, & Gotlib, 2002; Sloan, Bradley, Dimoulas, & Lang, 2002).

Less positive rumination has been found to be associated with slower recovery in depressed individuals (Rottenberg et al., 2002). Furthermore, positive rumination is related with manic symptoms (Feldman et al., 2008; Verstraeten, Vasey, Raes, & Bijttebier, 2012). Notably is that, in the study of Feldman and colleague's (2008), dampening was also found to be related with manic symptoms.

When comparing MDD and BD, they appear to differ in brain activations both while depressed and in remission (Rive et al., 2015). During depression, regulation of both negative and positive emotions (sad and happy) were impaired in MDD, whereas in BD only the regulation of negative emotion was impaired.

For decades, one of the most consistent gender stereotypes is the belief that women report more emotions than men (Williams & Best, 1990). In line with this stereotype, one might also expect a difference in affect regulation for gender. When looking at differences between men and women mixed results were found and most studies solely focused on the regulation of negative emotions. In a study of Gross and John (2003) about negative affect regulation, men score higher on suppression but no difference was found for other strategies. In another study no gender differences were found for negative affect regulation (Kwon, Yoon, Joormann, & Kwon, 2013). In a review of Nolen-Hoeksema (2012) women report using almost all types of negative affect regulation strategies more than men, including rumination, reappraisal, problem solving, acceptance, distraction and seeking social support.

When looking at diagnosis, a study of 2013 shows more rumination in bipolar II than in bipolar I disorder (BD-I) (Fletcher et al., 2013). In bipolar II disorder (BD-II), people are less likely to use adaptive behavioral coping strategies for dealing with positive affect. There is a failure to use strategies that 'dampen' hypomanic mood. This may stem from cognitive appraisals during hypomanic mood, that it is a positive experience rather than a threat (Parikh et al., 2007).

Very little research has been done on positive affect regulation in BD. Existing studies focus primarily on depression or on manic symptoms in nonclinical populations. By increasing our insight of the underlying processes in BD, we can develop interventions and improve current

treatment. This hopefully provides a more stable course of BD with less severe manic and depressive episodes. Accordingly, the overarching aim of this study was to learn more about the PA regulation strategies that are being used in different states of BD. To this end, we assessed the use of PA strategies and mood in a sample of 71 bipolar patients. The specific goals were fourfold.

The first goal of this study was to examine relationships between PA regulation and mood in bipolarity. The main focus is on people who are in treatment and fit the criteria for bipolar disorder according to the *DSM-IV* (American Psychiatric Association, 2000). In line with previous findings, it was expected that there is a positive relationship between dampening and depressive mood and a negative relationship between dampening and manic mood. Furthermore we speculated that the positive rumination strategies would be positively related to manic symptoms and negatively related to depressive symptoms.

The second goal of the study was to look at similarities in affect regulation strategies between bipolar patients (sample 1) and patients diagnosed with major depressive disorder (sample 2). In line with the findings of Rive and colleagues (2015) we expected that patients with MDD would report more strategies to dampen positive emotions compared to patients with BD.

The third goal of this study was to examine gender differences in affect regulation strategies. In line with results from previous research we predict women to report more affect regulation strategies then men, especially more use of rumination strategies (Nolen-Hoeksema, 2012).

The fourth goal is to compare bipolar I and bipolar II disorder. We expect that people with bipolar II disorder use more rumination during (hypo)manic mood.

2. Method

2.1 Participants

Participants of sample 1 are patients diagnosed with bipolar I or II disorder according to the *DSM-IV* who were recruited from Altrecht Bipolair (division of Altrecht, Utrecht, the Netherlands). The patients were approached during their scheduled appointment. Exclusion criteria included neurological diseases, current psychoses, current alcohol and/or substance abuse or dependence in the past month.

Sample 2 consisted of patients with major depressive disorder of Altrecht Mood Disorders (division of Altrecht, Utrecht, the Netherlands). All new patients who had an intake between March 2014 and February 2016 were potential participants.

2.2 Procedure

The study procedures were approved by the commission of scientific research of Altrecht. As for sample 1, everyone who had a scheduled meeting at Altrecht Bipolair in April 2016 was asked to participate. When arriving at the appointment, patients received information about the study. At the end of their appointment the specialist informed the patient again and asked if they wanted to participate. Eligible patients were invited to complete the Response to Positive Affect questionnaire. The specialist made sure an informed consent was signed and determined the current mood according to the Clinical Global Impression for bipolar disorders (CGI-BD) (Spearing, Post, Leverich, Brandt, & Nolen, 1997).

As for sample 2, data was gathered by the research team of Altrecht Mood Disorders. All new patients were asked to fill in a set of questionnaires, including the Response to Positive Affect (RPA) and the Inventory of Depressive Symptomatology (IDS).

2.3 Clinical Diagnosis and Symptoms

For sample 1, bipolar disorder was diagnosed by using the Structured Clinical Interview for *DSM-IV* (SCID-IV) administered by trained psychology master-level students and psychologists (First, Spitzer, & Gibbon, 1997). This interview assesses DSM-IV current and lifetime diagnoses for mood, anxiety, psychotic, alcohol and substance use, somatoform and eating disorders. Current mood status was determined by the specialists of Altrecht Bipolair according to the CGI-BD (Spearing, Post, Leverich, Brandt, & Nolen, 1997). This instrument serves as a simple tool for professionals to objectify mood and monitor it over time. Scores ranged from -7 to 7, whereas -7 implies very severely depressed. -1 to 1 was considered not ill, without depressive or manic symptoms. A 7 implies very severely manic. Because this study focusses primarily on an outpatient sample, scores of (-)6 or (-)7 were not expected. The distribution of current mood in sample 1 is displayed in figure 1.

In sample 2, major depressive disorder was diagnosed by healthcare professionals. Depression severity was measured by the Inventory of Depressive Symptomatology questionnaire (IDS). The IDS_{30} consists of 30 items and is available in a self-report ($IDS\text{-}SR_{30}$) and matched clinician rating ($IDS\text{-}C_{30}$). For this study we only used the $IDS\text{-}SR_{30}$. The $IDS\text{-}SR_{30}$ includes all nine criterion symptoms for MDD, based on the DSM-IV (American Psychiatric Association, 1994). Each symptom is scored on a 0-3 scale, with a total score range from 0-84. A total depression score between 6 and 10 was considered mild, between 11 and 15 moderate, between 16 and 20 severe and from 21 very severe (Rush et al., 2003). The $IDS\text{-}SR_{30}$ has high acceptable psychometric properties with a high internal consistency (Cronbach's alpha

= .92) (Trivedi et al., 2004). Also in the present study the internal consistency was high (Cronbach's alpha = .86). Total scored were ranging between 1 and 71. The distribution of depression scores in sample 2 is displayed in figure 2.

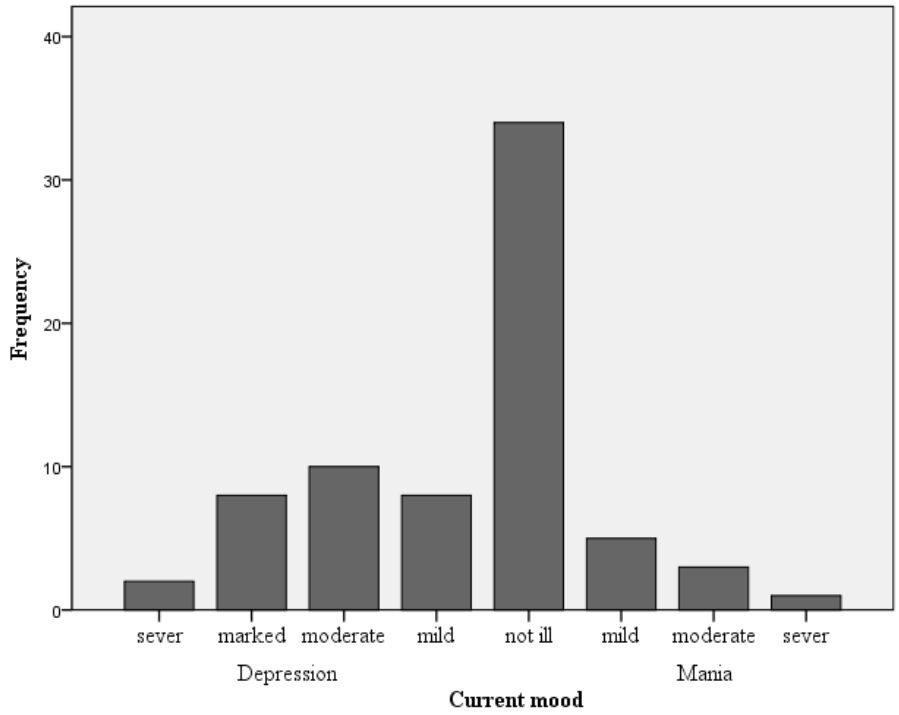

Figure 1: *Distribution current mood sample 1 (BD group)*

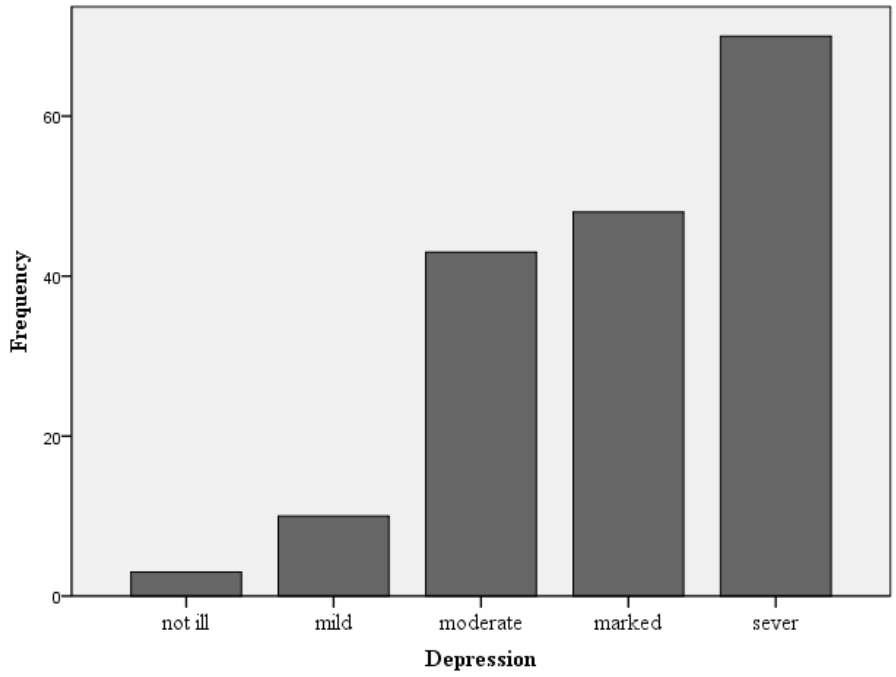

Figure 2: *Distribution depression severity sample 2 (MDD group)*

2.4 Responses to Positive Affect

To measure which positive affect regulation strategies are most frequently used, we ask participants to fill in the Dutch version of the Responses to Positive Affect scale (RPA). This is a questionnaire developed by Feldman and colleagues (2008). The RPA is a 17-item measure of ruminative and dampening responses to positive affect. Responses are rated on 4-point Likert scales ranging from one 'almost never' to four 'almost always'. Scores are distributed in three subscales: dampening, self-focused positive rumination and emotion-focused positive rumination. An example of an item regarding dampening is: "When you feel happy, how often do you think about things that could go wrong". An example of an item regarding self-focused positive rumination is: "When you feel happy, how often do you think: I am achieving everything". An example of an item regarding emotion-focused positive rumination is: "When you feel happy, how often do you think about how happy you feel". Both the original English and the used Dutch version of the RPA have acceptable internal consistency for each of the subscales (Feldman et al., 2008; Raes et al., 2009). Furthermore, the RPA shows an adequate reliability and validity for the subscales (Feldman et al., 2008). In the current study the internal consistency was good for self-focused rumination, emotion-focused rumination and dampening scales (Cronbach's alpha = .86, .85 and .84 respectively).

2.5 Statistical Analyses

All analyses were conducted in SPSS, version 23. Both sample 1 and 2 included three missing values. For these cases missing value mean imputation was conducted using SPSS (Hill, 1997).

Before conducting analyses, the data was examined for outliers. An outlier was defined when a data point was outside 1.5xIQR (interquartile range). Three outliers were found in sample 1 and seven outliers in sample 2. Because there was no obvious explanation for these outliers, analyses were initially conducted with outliers. When a significant difference was found between analyses with or without outliers, this was mentioned.

A cross-sectional design was used for sample 1 to gather a relatively large amount of data in a short amount of time. Correlational measures were used in both samples to examine the relationship between mood and PA regulation strategies. When examining the PA regulation strategies in depression, BD candidates with scores on mania higher than 1 on the CGI-BD were excluded. This was also the case vice versa. So when examining PA regulation strategies in mania, BD candidates with scores on depression higher than 1 were excluded. Spearman correlations were used because both variables were on an ordinal scale.

To explore if female participants use more PA regulation strategies than men, scores were compared performing independent sample t-tests. Independent sample t-tests were also used to examine if participants with BD-I showed less positive rumination than participants with BD-II.

3. Results

3.1 Sample characteristics

Sample 1 consisted of 71 respondents with BD, with a mean age of 45.93 years (*SD* = 12.45; range: 21-70), with an almost equal distribution of gender (53.5% female). Of the respondents 56 had a bipolar I disorder and 17 a bipolar II disorder.

On March 10th, 2016 the database for sample 2 consisted of 174 MDD patients, with a mean age of 39.74 years (*SD* = 10.01; range: 23-63). 54.6% of these respondents is female.

3.2 Correlations

First we examined correlations for the bipolar patients (sample 1) between current mood and PA regulation strategies. As shown in Table 2, all correlations between positive affect regulation strategies and mood in the BD group were non-significant. No relationships were found between mood in BD and PA regulation strategies. Therefore the results need to be interpreted with great caution. Looking at Table 2, it seems that dampening has a greater role in depression than in mania, whilst positive rumination is more present in mania.

Table 2: *Correlations of positive affect regulation subscales with current depression and manic severity in BD patients (sample 1)*

	Current mood	
PA regulation strategy	Depressed subgroup (n = 60)	Manic subgroup (n = 43)
Dampening	.204	.100
Positive rumination	-.022	.137
Self-focused	.044	.096
Emotion-focused	-.070	.178

To compare depression in BD and MDD, participants with current manic symptoms were excluded for the next analyses. Fisher's exact test shows that gender composition is similar in sample 1 and sample 2, see Table 3.

Sample 1 and 2 differ in age distribution, t(87) = 3.476, $p < .001$. However, because there is no evidence whatsoever that age plays a role in the relation between mood and PA regulation, we do not expect that this difference will influence the outcomes. Nevertheless we will keep this difference in mind when interpreting the results.

Whereas sample 1 has no significant correlation with respect to the PA regulation strategies, the variables in sample 2 were rather strongly linked ($p <.01$). With respect to MDD, people with higher depression scores were significantly more likely to endorse dampening positive affect. In BD the same result was non-significant. Furthermore, higher depression scores in MDD were significantly related to less positive rumination but not in BD. When taking a closer look at the dimensions of positive rumination in MDD, analyses show that less emotion-focused positive rumination is responsible for the significant relation with depressive mood. Self-focused positive rumination does not have a significant correlation with depression in MDD.

Table 3: *Descriptive Characteristics and Correlation between PA and depression in Sample 1(BD) with Depression and Sample 2 (MDD)*

	Sample	
	1 (BD) with depression (n = 60)	2 (MDD) (n = 174)
% Female	50.0	54.6
Age: *M* (and SD)	45.92 (12.44)	39.74 (10.01)
ρ		
Dampening	.204	.376**
Positive rumination	-.022	-.205**
Self-focused	.044	-.105
Emotion-focused	-.070	-.245**

***p < 0.01.*

3.3 Gender and diagnosis

We compared the PA regulation strategies in sample 1 for gender and diagnosis (i.e. bipolar I vs bipolar II) with an independent samples t-test. Levene's test for equality for variances was non-significant for both dampening and positive rumination, the variances in the two populations based on gender are the same. As shown in Table 4, no significant differences were found for gender. Men and women do not differ in PA regulation strategies they use.

Table 4: *Means and standard deviations of the PA regulation strategy scores compared for gender*

	mean (SD)			
PA regulation strategy	Male (*n* = 33)	Female (*n* = 38)	T (df)	*P*
Dampening	1.798 (.488)	1.598 (.497)	1.701 (69)	.093
Positive rumination	2.402 (.522)	2.436 (.478)	-.287 (69)	.775
Self-focused	2.161 (.576)	2.171 (.648)	-.067 (69)	.947
Emotion-focused	2.594 (.580)	2.647 (.508)	-.414 (69)	.680

Then we analyzed the difference between bipolar I and bipolar II disorder, see Table 5. Equal variances were assumed. BD-II patients were significant more likely to use dampening, t(69) = -2.025, $p < .047$. In positive rumination no significant differences were found, t(69) = -.1.301, $p < .198$. Although not all significant, the mean for all PA regulation strategies were higher in BD-II than in BD-I, with medium effect sizes, see Table 5.

Table 5: *Means and standard deviations of the PA regulation strategy scores compared for diagnosis*

PA regulation strategy	mean (SD)		T (df)	*p*	Cohen's *d*
	bipolar I disorder (*n* = 54)	bipolar II disorder (*n* = 17)			
Dampening	1.625 (.475)	1.900 (.530)	-2.025 (69)	.047*	.563
Positive rumination	2.378 (.499)	2.556 (.115)	-1.301 (69)	.198	.362
Self-focused	2.112 (.625)	2.338 (.544)	-.1.336 (69)	.186	.328
Emotion-focused	2.589 (.545)	2.729 (.524)	-.936 (69)	.353	.260

* $p < 0.05$.

4. Discussion

This research is the first study to examine positive affect regulation in an outpatient population diagnosed with bipolar disorder. For one month we gathered data of all BD patients who had an appointment. We compared these results with data obtained from patients with a major depressive disorder. We examined responses to positive emotions with the RPA and mood severity with the CGI-BP for the BD sample and the IDS for the MDD sample.

Contrary with our hypothesis and previous findings, no relationship was found in our group of BD patients between mood severity and PA regulation. Earlier findings that dampening is associated with depression severity were not replicated in the current study. Also a significant relation between positive rumination and manic severity was absent. Nevertheless, when comparing the different PA regulation strategies it seems that dampening has a greater role in depression than in mania and that positive rumination is more present in mania than in depression. Yet these findings are not statistically significant and thereby cannot really be addressed.

That our findings are not in line with our first hypothesis could have several explanations. First our hypothesis was based on previous findings yet previous research never focused on bipolar patients. Their focus was for instance on manic symptoms and severity in a population of non-diagnosed students (Feldman et al., 2008; Johnson & Jones, 2009; Raes et al., 2009). The only study about bipolar disorder and PA regulation was by Johnson and colleagues (2008) but their study focused on highly functional students with diagnosable BD. So it is possible that for BD, PA regulation does not play a role in mood severity and vice versa.

Second because our sample consisted of outpatients, it lacked of patients with severe depressive or manic symptoms. Bipolar patients with severe depression or mania are more likely to stay at home, reject help and end up in clinical settings (Kupka & Knoppert-van der Klein, 2008). There was especially an underrepresentation manic patients overall. It might be possible that specialists were reluctant to ask manic patients to participate in the study because of the sensitivity of the appointment already. People during mania often have limited insight, poor treatment adherence and the possibility to become a danger to themselves or their surroundings (Rakofsky & Dunlop, 2014). If the sample was more equally distributed, it would provide a more conclusive picture.

In MDD associations between depression severity and PA regulation are present. In line with previous findings, MDD patients who are more depressed were more likely to endorse dampening positive affect (Henriques & Davidson, 2000; Rottenberg et al., 2002). Moreover, more depressed individuals used positive rumination fewer. This is especially the case for emotion-focused positive rumination. When depression increases, MDD patients tend to ruminate less over positive affect and related experiences.

So when comparing BD and MDD one big conclusion can be drawn. Whereas in MDD correlation between mood and PA regulation is strong and can easily be seen, in BD this finding seems absent. This might add to the line of evidence that underlying processes in bipolar

depression differ from unipolar depression. Despite a strong overlap in BD and MDD, some variables are distinguished (Cuellar, Johnson, & Winters, 2005). Hence, dysregulation appears to be a bigger risk variable involved in BD than in MDD. Compared to MDD, BD is related to an earlier age of onset, more rapid recurrence and mood variability. Furthermore an unipolar depression is characterized by more anxiety and agitation than a bipolar depression. These findings correspond with an unlikeness in PA regulation for BD and MDD.

When looking at our third question, we found that men and women do not use different PA regulation strategies. This is contrasting with our hypothesis and previous findings. Previous research found that women used overall more regulation strategies, especially more emotion-focused positive rumination than men (Johnson et al., 2008; Nolen-Hoeksema & Aldao, 2011). One explanation for this difference is that all these studies, including the current study, focused on self-reports, what leaves them vulnerable for biases, like gender stereotypes. Also, it is possible that gender does not play a role in PA regulation in bipolar disorder.

Our final goal was to look at the difference between BD-I and BD-II. Compared to BD-I, BD-II patients tend to use more dampening. So BD-I patients are less likely to suppress positive affect and events than BD-II patients. One possible explanation for this difference is that it is harder for patients with BD-I to regulate their emotions. Evidence is found for impaired emotion regulation in BD-I but not in BD-II (Caseras et al., 2015). Patients with BD-II showed a well-preserved emotion regulation ability. A second possible explanation is that people with BD-I experience manic episodes while people with BD-II do not. A manic episode is characterized by remarkably positive thinking; inflated self-esteem, increased goal-directed activity and excessive involvement in pleasurable activities that have a high potential for painful consequences (American Psychiatric Association, 2000). To some extent it seems logical that for patients with BD-I it is less natural to dampen positive thinking than for patients who only experience milder hypomanic episodes. A third possible explanation is that patients with BD-II suffer more often from depressive episodes than patients with BD-I (Ayuso-Gutiérrez & Ramos-Brieva, 1982). Research to unipolar depressions show that depressive episodes are more related to dampening of PA (Henriques & Davidson, 2000; Rottenberg et al., 2002). It makes sense that the group who experience more depressive episodes are more likely to use dampening.

One limitation of the current study is that the group of patients who currently experienced a manic episode was small. It is possible that a significant relation between manic severity and PA regulation could not be found because of this reason. Nevertheless because our sample was composed of all patients in one month who had an appointment, we think the results are valid for outpatient bipolarity. Another limitation of this study is that medication use was not taken into account. Therefore we could not exclude medication as a possible moderator of correlations we examined. Also to measure PA regulation, this study was based on self-evaluations. It is possible that there was a reporting bias and that the mood state influenced answers on the RPA. Hereby it is important to study if PA regulation is a trait or state and if it is influenced by frequency and amount of mood episodes.

When comparing BD and MDD, different instruments were used to measure current depression severity. This could play a role in the differences in outcome. Also, whilst both groups consisted of more than 70 patients, the MDD group contained twice as much patients. Lastly, within this study it is impossible to determine whether PA regulation plays any role in increasing symptoms, or reflects a response to having distinct affective experiences. To study causality for this subject, longitudinal research is needed.

This is the first study about PA regulation in an outpatient bipolar sample. Our findings do not indicate a correlation between PA regulation and mood severity in BD. In MDD there is a clear positive relation between dampening and depression severity. Also a negative relation between positive rumination and depression severity was found. This is a distinct difference with BD. Furthermore no difference were found in BD women and men in PA regulation. Patients with BD-II use more dampening than individuals with BD-I. Further research should focus on longitudinal research to examine the relation between mood and positive affect regulation in BD and MDD over time. Also, the differences in affect regulation between BD and MDD should be further investigated.

Notwithstanding the above limitations, the present results do point to several implications. Treatment in MDD should focus more on PA regulation. Individuals with a broad range of affect regulation strategies will be able to flexibly adapt to a range of stressful situations, which might be an important factor for reducing depressive episodes in severity and frequency. Furthermore, in the treatment of BD it is important to distinguish between BD-I and BD-II. It might be helpful in BD-I to learn patients to control and regulate their emotions more by dampening positive affect and events. This is already done to a certain extent by writing down counterproductive thoughts and behavior in crisis prevention plans. More focus and research

on the subject of PA regulation leads to a better understanding of this concept and might help develop more effective interventions across populations.

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