# The Mediating Role of Responses to Positive Affect between Personal Recovery and Symptomatology in Bipolar Disorder

**MASTER THESIS**

Kathi Imani
1735233

Faculty of Behavioural, Management and Social Sciences

Department of Positive Psychology and Technology

Supervisors: Dr. Peter. M. ten Klooster & Jannis T. Kraiss, Msc.

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## Abstract

Personal recovery has received increasing attention and has become an important outcome for people with bipolar disorder (BD), a mood disorder characterized by positive and negative affective states. An important factor in BD are emotion regulation processes in response to positive affect (RPA). The objective of the this research was to investigate if dampening, self-focused positive rumination and emotion-focused positive rumination mediate the effect of personal recovery on manic and depressive symptoms in a clinical sample with BD. Data were used from a cross-sectional survey validation study by Kraiss et al. (2019a, 2019b) in which 107 participants diagnosed with BD were surveyed. Two multiple mediation models were tested using the bootstrapping approach developed by Preacher and Hayes (2008). The results suggested that dampening and self-focused positive rumination significantly mediated the effect of personal recovery on manic symptoms. Personal recovery yielded a decrease in dampening which yielded an increase in manic symptoms ($B$ = –.027 (.014), CI [–.060, –.004]). Furthermore, personal recovery yielded an increase in self-focused positive rumination which again yielded an increase in manic symptoms ($B$ =.031 (.014), CI [.008, .062]). Contrary to expectations, no significant mediation effect of responses to positive affect was found in the relation of personal recovery and depressive symptoms. The main limitation of the study was its cross-sectional design impeding inferences about causality and direction of the effects. Future studies could replicate this research in longitudinal and experimental studies to confirm the mediating role of dampening and self-focused rumination. Furthermore, patients with BD might benefit from future studies further investigating the role of responses to positive affect in BD in order to address those mechanism adequately in prospective therapies.

# The Mediating Role of Responses to Positive Affect between Personal Recovery and Symptomatology in Bipolar Disorder

Bipolar disorder (BD) refers to a group of chronic mood disorders characterized by shifting depressive and manic or hypomanic episodes (Belmaker, 2004). The latter is an attenuated manic episode with decreased severity and duration of symptoms (Phillips & Kupfer, 2013). The diagnostic and statistical manual 5 (DSM-5) distinguishes between BD type I (manic and possible depressive episodes) and BD type II (hypomanic and major depressive episodes) (American Psychiatric Association, 2013). The lifetime prevalence differs for BD I and BD II with 0.6% and 0.4% respectively in an international sample of 11 countries (Merikangas et al., 2011). In the Netherlands the lifetime prevalence of BD is estimated slightly higher with 1.3% for the general population (de Graaf, Have, & van Dorsselaer, 2010). The 12 month prevalence is 0.8% (de Graaf et al., 2010).

Being affected by BD imposes a severe impact on life during acute and inter-episode periods (Grande et al., 2013). A wide range of areas of life can be negatively affected (Rosa et al., 2007), such as cognitive functioning, financial security, interpersonal functioning in family and romantic relationships (Belmaker, 2004) leisure time, autonomy and occupational functioning (Grande et al., 2013). The latter is particularly affected due to the early onset of BD in young adulthood (Grande, Berk, Birmaher, & Vieta, 2016), an age of professional orientation and training.

The treatment of BD usually comprises pharmacotherapy in combination with psychoeducation and psychotherapeutic approaches. Treatment of acute episodes focuses on stabilisation, whereas long term treatment has a greater focus on individual functioning and relapse prevention (Grande et al., 2016). Relapse constitutes a major issue in the course of BD. The disorder is characterized by episodes of remission and recurrence. Between acute episodes and during periods of clinical remission, residual symptoms such as cognitive impairment and depressive symptoms remain present and often form a risk factor for relapse (Samalin, de Chazeron, Vieta, Bellivier, & Llorca, 2016). Other residual symptoms are sleep difficulties, disruption of the circadian rhythm, emotional dysregulation and sexual dysfunction (Samalin et al., 2016). The chronic and recurrent nature of BD leads to people being affected throughout their lifetime (Grande et al., 2016). Because of this, clinical recovery in the sense of regaining a state of health previous to the onset of the disorder or the absence of symptomatology (Fava, Ruini, & Belaise, 2007) might be challenging to achieve and does not seem to be a realistic goal of treatment. Recovery, defined as symptoms falling under a specific threshold and remaining low for a certain period of time (Fava et al., 2007),

on the other hand, is often more achievable. However, even if such recovery a is achieved, this does not equate to a personal sense of recovery for patients. They may still have significant complaints and need to deal with the impact of their illness. Hence, a more adequate and personalized approach to recovery is needed.

As a reaction to the focus on personal recovery, a patient movement arose, promoting the importance of personal recovery in the treatment of mental illness. In recent decades, personal recovery is receiving increasing attention in research (Fava et al., 2007; Jones et al., 2012; Leamy, Bird, Boutillier, Williams, & Slade, 2011) and mental health care systems, especially in Anglophone countries (Bird et al., 2014). Personal recovery is considered essential by patients themselves. People affected by severe mental illness such as BD argue for the importance of personal recovery (Jones et al., 2012) and have driven the movement towards personal recovery through for example user-lead research (Pitt, Kilbride, Nothard, Welford, & Morrison, 2007). Personal recovery is defined as "… *a deeply personal, unique process of changing one's attitudes, values, feelings, goals, skills, and/or roles. It is a way of living a satisfying, hopeful, and contributing life even with limitations caused by illness"* (Anthony, 1993, p. 527). It emphazises the positive and focusses on rebuilding one's life and self, and creating hope for a better future (Pitt et al., 2007).

To operationalize personal recovery, Leamy et al. (2011) developed a conceptual framework. Based on a systematic review of current recovery definitions and a narrative analysis, three superordinate concepts were identified: The recovery journey, recovery states and recovery processes. Furthermore, Leamy et al. (2011) identified five key dimensions of the recovery process that are most relevant and applicable for research and clinical practice. These five key dimensions encompass connectedness, hope and optimism about the future, identity, meaning in life and empowerment, comprising the acronym CHIME.

There are several questionnaires to measure personal recovery in people with BD. The questionnaire that measures personal recovery most closely to the CHIME framework is the Questionnaire about the Process of Recovery (QPR; Shanks et al., 2013). The QPR has been validated in a clinical sample of BD and appears to be a valid and reliable tool to assess personal recovery in BD (Kraiss et al., 2019a). A strong negative association between personal recovery and depressive symptoms and a weak positive association between personal recovery and symptoms of mania was found (Kraiss et al., 2019a).

Another measurement tool to assess recovery in people with BD is the Bipolar Recovery Questionnaire (BQR; Jones, Mulligan, Higginson, Dunn, & Morrison, 2013). The BQR was specifically informed by the experiences of recovery of people with BD (Jones et

al., 2013). However, the BRQ seems to be less feasible due to high item numbers as compared to the QPR (Kraiss et al., 2019a). Nevertheless, Jones et al. (2013) found recovery to be strongly correlated to decreased depressive symptoms. Interestingly, no significant association between recovery and symptoms of mania was revealed, yet individual items that measured elevated mood yielded a moderate negative relationship with recovery (Jones et al., 2013). Similarly, strong negative associations were obtained between recovery and depressive symptoms, and no significant relationship was found between recovery and symptoms of mania in a study by Dodd et al. (2017).

Interestingly, the three studies measuring personal recovery and symptoms of mania all reported low symptoms of mania in their samples and argue this might be the reason for merely weak or non-significant correlations (Dodd et al., 2017; Jones et al., 2013; Kraiss et al., 2019a). However, it remains unknown how personal recovery and symptomatology relate to each other. Little is known about the underlying processes of their relationship with empirical work being limited (Dodd et al., 2017). Dodd et al. (2017) provide preliminary support that appraisals in reaction to affective states are the underpinning mechanisms for outcomes such as recovery in BD. They show that negative self-appraisals regarding depressed mood and extreme appraisals of activated mood were negatively associated with recovery (Dodd et al., 2017). Building on the importance of appraisal of affective states, it seems also important how emotional states are regulated as these regulation processes may mediate the relation between personal recovery and symptomatology.

Emotion regulation processes play a crucial role in the development and maintenance of affective disorders and constitute an important target mechanism in most psychotherapies such as cognitive behavioural therapy (CBT). The emotion regulation process in response to an affective state rather than the affective state itself is considered essential in the development and maintenance of mood disorders (Raes, Daems, Feldman, Johnson, & Van Gucht, 2009). The importance of emotion regulation processes in response to negative affective states is well established in the literature (Nolen-Hoeksema, 1991; Feldman et al., 2008) with most research focussing on patient's responses to negative affective states (Feldman, Joormann, & Johnson, 2008).

However, little is known about responses to positive affect and their role in mental illness. However, research by Feldman, Joormann and Johnson (2008) suggests that responses to positive affect play an equally important role in the onset, maintenance and recurrence of an affective disorder. In those vulnerable to mania, positive life events accompanied by positive mood lead to an increase in confidence, which can upward spiral into excessive goal

pursuit and is believed to trigger manic symptoms (Johnson, 2005). Hence, responses to positive affect might trigger manic symptoms in those vulnerable to mania (Johnson, 2005). Therefore, understanding responses to both negative and positive affective states seems to be important for treatment and recovery in BD.

There are two general tendencies to regulate positive emotions, to decrease and dampen or to increase and intensify the mood. Feldman et al. (2008) defined three processes in response to positive affect (RPA). First, dampening – a strategy to decrease the duration and intensity of positive mood by suppressing positive emotions. Second, self-focused positive rumination – a tendency to recurrently think about positive self-qualities such as strengths and personal goals. Third, emotion-focused positive rumination – a tendency to think extensively about own positive affective states and experiences (Feldman et al., 2008). The Responses to Positive Affect Questionnaire (RPA) was developed to measure these three processes (Feldman et al., 2008).

In three student samples, higher depressive symptoms were found to be moderately (Feldman et al., 2008; Johnson, McKenzie, & McMurrich, 2008) and strongly (Raes et al., 2009) associated with more dampening. Furthermore, depressive symptoms were weakly associated with both lower self-focused positive rumination (Feldman et al., 2008) and emotion-focused positive rumination (Raes et al., 2009). Interestingly, dampening was not found to be associated with symptoms of mania (Feldman et al., 2008; Johnson et al., 2008; Raes et al., 2009) but was weakly associated with increased vulnerability to mania/hypomanic symptoms (Feldman et al., 2008). Similarly, Raes et al. (2009) found hypomanic symptoms to be weakly associated with more dampening. Additionally, vulnerability to mania was weakly associated with increased self-focused positive rumination and moderately associated with increased emotion-focused positive rumination (Feldman et al., 2008). Moreover, manic symptoms were found to be weakly correlated with increased self-focused positive rumination and moderately correlated with increased emotion-focused positive rumination in a sample of undergraduate students affected by BD (Johnson et al., 2008).

To date, only one study has investigated RPA in a clinical sample with BD. Kraiss et al. (2019b) found responses to positive affect to explain variance in personal recovery above and beyond symptomatology in a sample with BD. Furthermore, they showed dampening to be moderately correlated with reduced personal recovery and weakly associated with increased depressive symptoms. Self-focused positive rumination was moderately associated with both an increase in personal recovery and symptoms of mania (Kraiss et al., 2019b). Additionally, they showed that emotion-focused positive rumination was moderately

correlated with increased personal recovery and moderately associated with weaker depressive symptoms (Kraiss et al., 2019b).

However, little is known about how responses to positive affect relate to personal recovery and symptomatology. Previous research has shown that responses to positive affect explain the relationship between linking (the belief that goal attainment leads to happiness) and psychological functioning (Yang & Li, 2016) and mediate the effect of linking on psychological functioning. Similarly, the relationship between self-compassion and depressive symptoms was shown to be mediated by brooding, a negative form of rumination (Raes, 2010). So far, however, it remains untested, weather there is an indirect effect of responses of positive affect in the relationship between personal recovery and symptomatology in BD. This might provide insight into the function of responses to positive affect. It seems important to know if dampening, self-focused positive rumination and emotion-focused positive rumination have a facilitating or detrimental effect on the relationship of personal recovery and symptomatology in order to, for example, inform prospective therapies.

Therefore, the aim of the current study is to further investigate and explore how personal recovery, responses to positive affect and symptomatology are related in persons with BD. It will be tested if dampening, self-focused positive rumination and emotion-focused positive rumination mediate the effect of personal recovery on symptoms of depression and mania.

## Method

### Design and procedure

The current study was a post hoc analysis of the data used in the study by Kraiss et al. (2019a, 2019b). The original study was a questionnaire validation study using a cross-sectional design. After the initial study was approved by the Ethics Committee of the University of Twente, data were collected between April and July 2018. The survey was conducted using the online survey tool LimeSurvey (https://limesurvey.org/). Participants were recruited through convenience sampling via the Dutch Patient Association for Bipolar Patients (http://www.vmdb.nl/), where the study was advertised in the newsletter of the patient association. Furthermore, an email was sent to all members of the patient association. Both, the email and newsletter announcement, provided a link to the survey. Participants diagnoses were self-reported and not assessed with a clinical interview. Participants were informed about the aim of the survey study and that their data were processed confidentially

and anonymously. Ten shopping vouchers, worth 50 euros each, were raffled among all participants.

## Measures

Demographic data including age, gender, marital status, employment status and educational level were measured. Additionally, clinical variables such as diagnosis (BD I or BD II), whether they had experienced a relapse into a mood episode in the past six months, whether they were currently in psychological or psychiatric treatment and, whether they were currently taking medication, were obtained. Furthermore, several constructs from the original study were selected to investigate in the current study. All constructs were measured using standardized existing questionnaires.

### *Personal recovery*

The 15-item version of the Questionnaire about the Process of Recovery was used to measure personal recovery over the past seven days (QPR; Neil et al., 2009). Items were scored on a five-point Likert scale ranging from 0 (*disagree strongly*) to 4 (*agree strongly*), with a higher score indicating increased personal recovery. For the purpose of their study, Kraiss et al. (2019b) translated the English version of the QPR into Dutch using forward and backward translation. Cronbach's alpha α of the total scale was .93 in the current sample (Kraiss et al., 2019b).

### *Symptoms of depression*

The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) was used to measure symptoms of depression in the past week. In total, the HADS consists of 14-items and measures the presence and strength of symptoms of anxiety and depression with seven items each. Items were scored on a scale from 0 (*very weak*) to 3 (*very strong*), with higher scores indicating a more frequent presence of the symptoms. The HADS has shown to be a reliable measuring instrument with Cronbach's alpha α for the depression subscale of .82 (Herrero et al., 2003). In the current sample, Cronbach's alpha α was sufficient with .73 for the depression subscale (Kraiss et al., 2019b).

### *Symptoms of mania*

The Altman Self-Rating Mania Scale (ASRM; Altman, Hedeker, Peterson, & Davis, 1997) was used to measure manic symptoms over the past seven days. The scale consists of five items. The five items comprise increased cheerfulness, inflated self-confidence, talkativeness, reduced need for sleep, and excessive behavioural activity. Each item has five options to answer, with higher numbers indicating an increase in symptom severity. The

ASRM has shown to have good internal consistency with Cronbach's alpha α of .79 (Altman et al., 1997). In the current study Cronbach's α was .73 (Kraiss et al., 2019b).

*Responses to positive affect*

The Responses to Positive Affect Questionnaire (RPA; Feldman, Joormann, & Johnson, 2008; Raes et al., 2009) was used to assess cognitive responses to positive affective states. The 17-item questionnaire consists of three subscales: (a) dampening, consisting of eight items; (b) self-focused positive rumination, consisting of four items and (c) emotion-focused positive rumination, consisting of five items. On a 4-point Likert scale, ranging from 1 (*almost never*) to 4 (*almost always*), participants rated the frequency of their responses. In accordance with Kraiss et al. (2019b), item six of the dampening subscale was excluded based on a very low factor loading of 0.13. In the current sample, Cronbach's alpha α was .80 for the dampening subscale, .75 for the self-focused positive rumination subscale and .77 for the emotion-focused positive rumination subscale (Kraiss et al., 2019b).

**Statistical analysis**

The data were analysed using the statistical program SPSS version 25 and the PROCESS macro for SPSS by Hayes (http://processmacro.org). First, bivariate correlations among all variables were calculated using Pearson correlations. The strength of the correlation were interpreted as small ($r$ = .10 to $r$ = .30), medium ($r$ = >.30 to $r$ = .50) and large ($r$ = >.50) (Cohen, 1988). Then, simple mediation analysis was performed for all mediators with symptoms of mania and depressive symptoms as independent variables.

Finally, to examine if dampening, self-focused positive rumination and emotion-focused positive rumination mediated the effect of personal recovery on either depressive or manic symptoms, two multiple (parallel) mediation models were tested. Multiple mediation analysis was performed to determine the differential contribution to the mediation effect of several mediators simultaneously.

For all mediation analyses, the bootstrapping approach developed by Preacher and Hayes (2008) was used. This is a non-parametric method that does not assume a normal sampling distribution of indirect effects (Preacher & Hayes, 2008). This method is superior to the Sobel test that assumes a normal distribution of indirect effects, which is rarely found in finite/small sample sizes (Preacher & Hayes, 2008). The sample was resampled 5000 times for the analysis of direct and indirect effects. The indirect effect comprises the path of the independent variable (personal recovery) via the putative mediators (dampening, self-focused positive rumination, emotion-focused positive rumination) and the two dependent variables

(depressive and manic symptoms). To assess if a mediation effect was present, point estimates and bias-corrected Confidence Intervals (CI) of the indirect effects were derived. If this CI does not include zero, a significant mediation effect is indicated.

## Results

### Descriptive statistics of the sample

Characteristics and descriptive statistics of the sample are displayed in Table 1. The participants' ($N$ = 107) mean age was 52 years (range 23-77). Eighty-two participants were female (76.6%) and 25 participants were male (23.4%). All participants were diagnosed with BD, whereof 42 (39.3%) were diagnosed with BD I and an almost equal number of 51 (47.7%) participants were diagnosed with BD II. Some participants were not aware of their type of BD. Most participants in the sample (93.5%) were currently taking medication and were currently in psychological or psychiatric treatment (83.2%).

### Bivariate associations

The results of the bivariate correlation analysis among all variables are displayed in Table 2. Personal recovery correlated strongly with less depressive symptoms ($r$ = –.70, $p$ < .001) and, interestingly, weakly with increased manic symptoms ($r$ = .21, $p$ < .05). Personal recovery was moderately associated with less dampening ($r$ = –.33, $p$ < .001) and more self-focused positive rumination ($r$ = .31, $p$ < .001) and emotion-focused positive rumination ($r$ = .41, $p$ < .001). Depressive symptoms were weakly associated with more dampening ($r$ = .20, $p$ < .05) and moderately associated with less emotion-focused positive rumination ($r$ = –.38, $p$ < .001). A moderate correlation was found between manic symptoms and self-focused rumination ($r$ = .34, $p$ < .001). No significant associations were found between depressive symptoms and self-focused positive rumination ($r$ = .19); manic symptoms and dampening ($r$ =.14); and manic symptoms and emotion-focused positive rumination ($r$ = .18).

Table 1

*Demographic and clinical characteristics of the participant sample (N = 107)*

| Variable | | N (%) |
|---|---|---|
| Age (mean. Range) | 52 (23-77) | |
| Gender | Female | 82 (76.6) |
| | Male | 25 (23.4) |
| Diagnosis | BD I | 42 (39.3) |
| | BD II | 51 (47.7) |
| Marital status | Married | 56 (52.3) |
| | Never married | 28 (26.6) |
| | Divorced | 22 (20.6) |
| | Widowed | 1 (0.9) |
| Employment status | Unable to work | 39 (36.4) |
| | Paid work | 26 (24.3) |
| | Unpaid/voluntary work | 14 (13.1) |
| | Retired | 10 (9.3) |
| | Houseman/housewife | 5 (3.7) |
| | Self-employed | 4 (4.7) |
| | Student | 3 (2.8) |
| | Other | 6 (5.6) |
| Educational level | Low | 14 (13.2) |
| | Moderate | 35 (33.1) |
| | High | 57 (53.7) |
| Relapse into mood episode (past six months) | Yes | 59 (55.1) |
| | No | 48 (44.9) |
| Currently in psychological or psychiatric treatment | Yes | 89 (83.2) |
| | No | 18 (16.8) |
| Currently taking medication | Yes | 92 (95.3) |
| | No | 5 (4.7) |

*Abbreviations: BDI, bipolar disorder I; BDII, bipolar disorder II.*

Table 2

*Intercorrelations among variables, means and standard deviations*

| Variables | **1** | **2** | **3** | **4** | **5** | **6** | **Mean** | **SD** | **N** |
|---|---|---|---|---|---|---|---|---|---|
| **1.** Depression | – | | | | | | 9.61 | 3.98 | 98 |
| **2.** Mania | -.20* | – | | | | | 2.98 | 3.22 | 98 |
| **3.** Dampening | .20* | .14 | – | | | | 13.34 | 3.97 | 107 |
| **4.** Self-focused | -.19 | .34** | -.14 | – | | | 8.20 | 2.63 | 107 |
| **5.** Emotion-focused | -.38** | .18 | -.25** | .62** | – | | 12.29 | 2.89 | 107 |
| **6.** Personal recovery | -.70** | .21* | -.33** | .31** | .41** | – | 37.65 | 11.14 | 102 |

*p<.05; **p<.01

**Simple mediation effects**

Simple mediation models were tested for all mediators with personal recovery as independent variable and with symptoms of mania and depression as dependent variables. Indirect effects of the simple mediation models are presented in Table 3. Two significant simple mediation effects were found. Dampening significantly mediated the effect of personal recovery on symptoms of mania (*B* = –.027 (.014), CI [–.060, –.004]). Furthermore, self-focused positive rumination significantly mediated the effects of personal recovery on symptoms of mania (*B* = .031 (.014), CI [.008, .062].

Table 3.

*Indirect effects of simple mediator models with symptoms of mania or depression as DV (N = 98)*

| Mediator | Mania | | | | Depression | | | |
|---|---|---|---|---|---|---|---|---|
| | B | SE | CI | | B | SE | CI | |
| | | | Lower | Upper | | | Lower | Upper |
| Dampening | –.027 | .014 | **–.060** | **–.004** | .009 | .010 | –.011 | .029 |
| SFR | .031 | .014 | **.008** | **.062** | .008 | .009 | –.010 | .027 |
| EFR | –.014 | .013 | –.009 | .044 | –.014 | .013 | –.045 | .008 |

*Note. Bold numbers reflect a significant mediation effect; SFR, self-focused positive rumination; EFR, emotion-focused positive rumination.*

**Multiple mediation model with symptoms of mania as dependent variable**

A multiple mediator model with personal recovery as independent, dampening, self-focused positive rumination and emotion-focused positive rumination as mediators and symptoms of mania as dependent variable was tested. In accordance with the univariate analysis, there was a total effect of personal recovery on symptoms of mania. Importantly, two significant and similarly strong indirect effects were found. Interestingly, the two mediators showed different directions. Dampening mediated the effect of personal recovery on symptoms of mania (*B* = –.026 (.013), $p < .05$, CI [–.057, –.006]) in such a way that personal recovery yielded a reduction in dampening which yielded an increase in symptoms of mania. On the other hand, self-focused positive rumination mediated the effects of personal recovery on symptoms of mania (*B* = .034 (.015), $p < .05$, CI [.006, .066]) in the opposite direction. Increased personal recovery led to more self-focused positive rumination which yielded higher symptoms of mania. All results of the multiple mediation model are displayed in Figure 1. The indirect effects of the multivariate analysis are presented in Table 4.

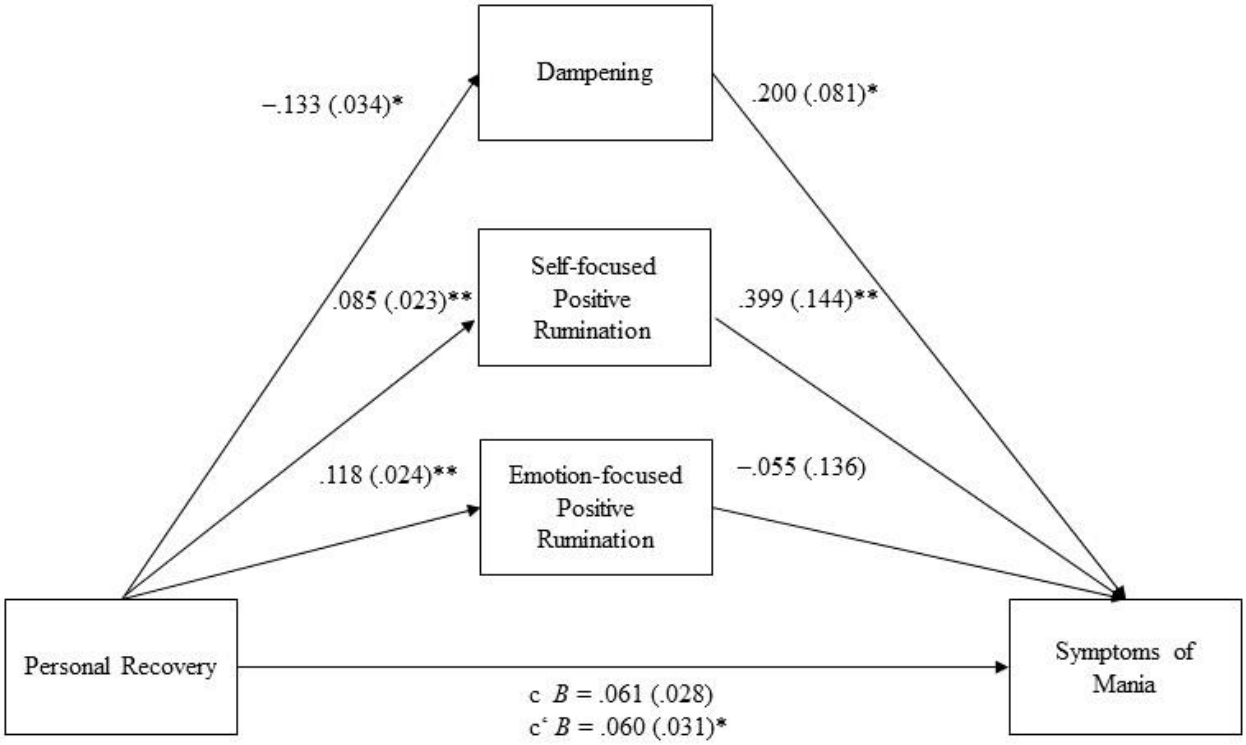


**Figure 1.** Multiple mediation model (N = 98). Each pathway includes an unstandardized coefficient of the direct relationship of two variables. The c path displays the total effect of personal recovery on symptoms of mania. The c' path displays the effect of personal recovery on symptoms of mania after accounting for dampening, self-focused positive rumination and emotion-focused positive rumination (direct effect). Beta- coefficients are unstandardized with SE presented in parentheses. * $p < .05$, ** $p < .01$

Table 4.

*Indirect effects of two multiple mediator models with symptoms of mania or depression as DV (N = 98)*

| Mediator | Mania | | | | Depression | | | |
|---|---|---|---|---|---|---|---|---|
| | B | SE | CI | | B | SE | CI | |
| | | | Lower | Upper | | | Lower | Upper |
| Dampening | –.026 | .013 | **–.057** | **–.006** | .011 | .011 | –.008 | .036 |
| SFR | .034 | .015 | **.006** | **.066** | .021 | .014 | –.000 | .056 |
| EFR | –.006 | .014 | –.034 | .025 | –.032 | .020 | –.078 | .000 |

*Note. Bold numbers reflect a significant mediation effect; SFR, self-focused positive rumination; EFR, emotion-focused positive rumination.*

**Multiple mediation model with depressive symptoms as dependent variable**

The multiple mediation model of personal recovery on symptoms of depression revealed no significant mediation effect of dampening, self-focused positive rumination and emotion-focused positive rumination. All results of the multiple mediation model are displayed in Figure 2.

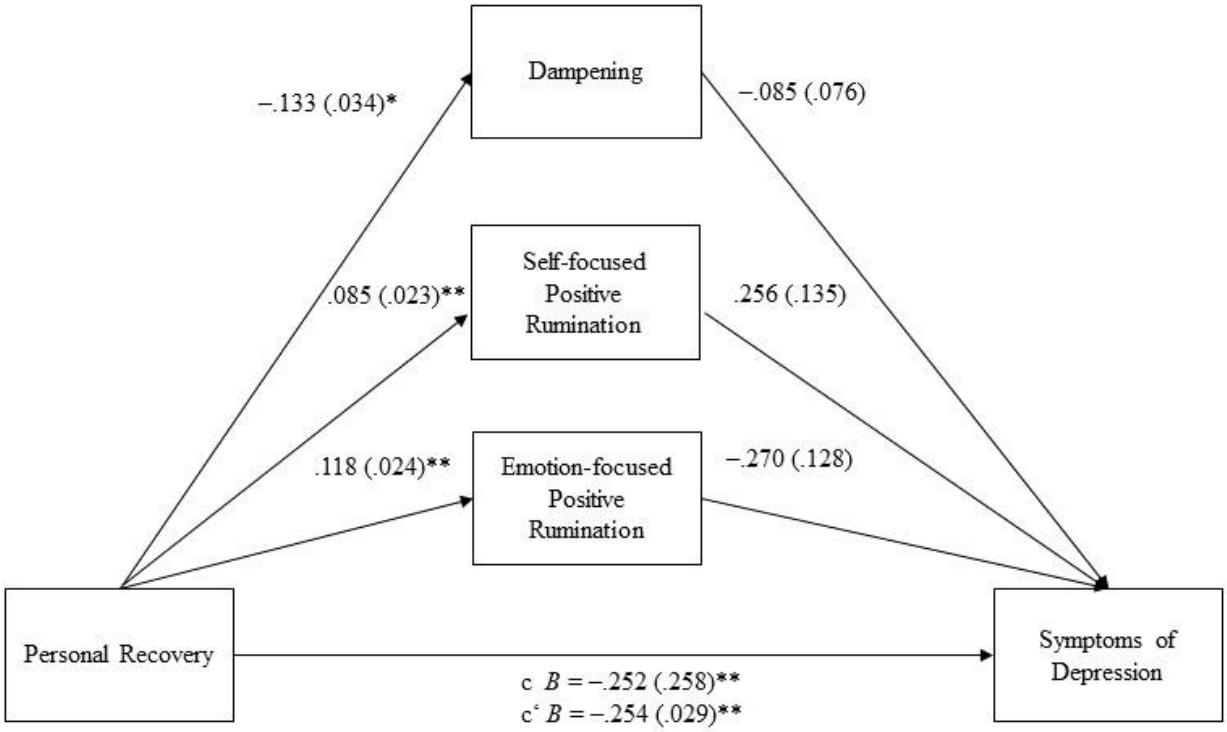


**Figure 2.** Multiple mediation model (N = 98). Each pathway includes an unstandardized coefficient of the direct relationship of two variables. The c path displays the total effect of personal recovery on symptoms of depression. The c' path displays the effect of personal recovery on symptoms of depression after accounting for dampening, self-focused positive rumination and emotion-focused positive rumination (direct effect). Beta-coefficients are unstandardized with SE presented in parentheses. * $p < .05$, ** $p < .01$

## Discussion

Based on the association of personal recovery, symptomatology and responses to positive affect (Kraiss et al., 2019b), the present study aimed to further investigate the nature of their relationship and explore how personal recovery affects symptomatology in a clinical sample of people with BD. The differential contribution of dampening, self-focused positive rumination and emotion-focused positive rumination in mediating the relation between personal recovery and symptomatology was examined.

The present results indicate that dampening and self-focused positive rumination mediate the effect of personal recovery on symptoms of mania. The results suggest that personal recovery yields less dampening which in turn leads to increased symptoms of mania. On the other hand, it is suggested that personal recovery yields an increase in self-focused positive rumination, which then again leads to an increase in symptoms of mania. Interestingly, the results indicate that personal recovery decreases dampening but increases

self-focused positive rumination. However, both strategies eventually yield an increase in symptoms of mania. In the current sample the use of dampening and self-focused positive rumination appears to have an undesirable effect on symptoms of mania. It seems that people with BD use dampening and self-focused positive rumination in a maladaptive way to regulate their emotions.

Surprisingly, the direct link between personal recovery and symptoms of mania was positive, yet weak. This might indicate that manic symptoms yield feelings of recovery or that feelings of recovery yield an increase in symptoms of mania. This finding is not in line with Jones et al. (2013) and Dodd et al. (2017). They found weak negative or non-significant correlations between personal recovery and symptoms of mania, respectively. However, self-reported manic symptoms have not been consistently associated with recovery in the literature (Jones et al., 2013). A possible explanation for this inconsistency and the positive association of personal recovery and manic symptoms might be due to low reported manic symptoms in the current sample. Personal recovery and manic symptoms might have a curved linear association. It might be that hypomanic symptoms are positively associated with personal recovery but that this relationship becomes negative when manic symptoms increase in severity. For example, “I feel more self-confident” (ASRM, item 2) and “I can take charge of my life” (QPR, item 12) were positively correlated ($r = .254$, $p < .05$). However, when a person is experiencing an acute manic episode it seems likely that this negatively affects a person’s ability to take charge of one’s life. Likewise, Grande et al. (2016) state that temporarily hypomanic symptoms can lead to an increase in occupational functioning, whereas manic symptoms lead to a decrease in occupational functioning. For future research, it might be interesting to investigate if personal recovery and manic symptoms have a non-linear association in samples with higher manic symptomatology.

Dampening was shown to mediate the relationship of personal recovery and symptoms of mania. The feeling of recovery was negatively associated with dampening, a tendency to decrease the intensity and duration of positive mood. It can be interpreted that people who experience a sense of recovery subsequently less dampen their positive affect. In other words, they allow their positive feelings to be. This in turn might, however, lead to a positive upwards spiral and trigger symptoms of mania. This finding is in line with (Gilbert, Nolen-Hoeksema, & Gruber, 2013) who found an increased use of dampening to predict manic symptoms in persons with BD.

Furthermore, self-focused positive rumination mediated the effect of personal recovery on symptoms of mania. However, the relation between personal recovery and self-focused

positive rumination was positive. Hence, personal recovery appears to increase self-focused positive rumination which then yields an increase in symptoms of mania. A possible explanation for the latter could be that the feeling of recovery comprising connectedness, feelings of hope, optimism about the future, meaning in life and empowerment (Leamy et al., 2011) can have a positive effect on mood. People affected by mania show an increase in confidence during periods of positive mood (Johnson, 2005). Increased confidence in combination with ambiguous goals can lead to an excessive goal pursuit, which then can trigger symptoms of mania (Johnson, 2005). Self-focused positive rumination, the tendency to recurrently think about positive self-qualities such as strengths and personal goals might play a facilitating role in this process.

Surprisingly, no significant mediation effect was found of emotion-focused positive rumination in the relation of personal recovery and symptoms of mania. This might be due to a strong intercorrelation of self-focused and emotion-focused positive rumination and thereby no added mediation effect of emotion-focused positive rumination in the multiple mediation model was found. However, when emotion-focused positive rumination was tested as a single mediator, no significant indirect effect between personal recovery and symptoms of mania was revealed. Likewise, emotion-focused positive rumination and symptoms of mania did not appear to be significantly correlated. A possible explanation might be that self-focused positive rumination is more likely to be linked to manic symptoms because it focuses on personal qualities and positive events, whereas emotion-focused positive rumination is more likely to be linked to symptoms of depression because it is a strategy that specifically focuses on emotional states (Kraiss et al., 2019b).

Symptoms of depression were moderately associated with more emotion-focused positive rumination and weakly associated with less dampening. In accordance with prior studies, depressive symptoms showed to be strongly and negatively associated with personal recovery (Dodd et al., 2017; Jones et al., 2013), suggesting that increased feelings of personal recovery might yield lower depressive symptoms or vice versa. Contrary to expectations, no significant mediation effect of responses to positive affect was revealed between personal recovery and depressive symptoms. A possible explanation for this finding might be that personal recovery and depressive symptoms correlate so strongly that potential mediators did not add to this correlation.

**Limitations and future directions**

There are several limitations to the research outlined in this paper. First of all, the main limitation of the study is its cross-sectional design. Therefore, causality and temporal

associations cannot be inferred. However, mediation is based on causal processes that unfold over time (Maxwell & Cole, 2007; Preacher & Hayes, 2008). For mediation to take place, personal recovery should cause a change in the mediators which then cause a change in symptomatology. The effect of the mediators on symptomatology would help to explain how personal recovery affects symptomatology. Since the cross-sectional data do not allow to conclude if a change in the mediators precedes and causes a change in symptomatology, mediation can merely be assumed. Therefore, the results should be treated with caution.

To infer temporal precedence, studies with longitudinal designs should be conducted (Maxwell, Cole, & Mitchell, 2011). An intensive, longitudinal data collection method is the experience sampling method, which assesses data in the moments and situations as it occurs (Larson & Csikszentmihalyi, 1983; Scollon, Kim-Prieto, & Scollon, 2003). Future studies could administer the experience sampling method via mobile devices, which has shown to be feasible for bipolar symptomatology (Schwartz, Schultz, Reider & Saunders, 2016). Finally, to infer causality, an experimental modification of the mediator would be needed (Schönfeld, Brailovskaia, Bieda, Zhang, & Margraf, 2016).

A second limitation is the use of the ASRM to assess manic symptoms. The ASRM is a self-report measure and as such prone to memory biases (Scollon et al., 2003). Moreover, during manic episodes people with BD might have little insight into their symptoms. Patients might not recall or interpret their hypomanic mood states accurately and might enjoy and find elevated mood states desirable (Grande et al., 2016). Furthermore, about 75% percent of people experience psychotic symptoms and delusions during an acute manic episode (Goodwin & Jamison, as cited in Grande et al., 2016). It seems unlikely that an individual would participate in a research during a manic episode. Additionally, the DSM-5 defines manic and hypomanic episodes when symptoms are present for 7 and 4 consecutive days, respectively (American Psychiatric Association, 2013). The ASRM measure symptoms of mania over the past seven days. This short recall period combined with the relatively short periods of manic and hypomanic episodes makes it also unlikely that manic symptoms are accurately reflected in a sample and detected by the ASRM.

Thirdly, another weakness regarding the ASRM might have been the validity of the instrument. So far, only three studies have examined the validity of the ASRM (Altman, 1998; Altman et al., 1997; Kim & Kwon, 2017). However, two of these studies are from Altman himself, whereof one study reviews self-rating tools in general. The third study by Kim and Kwon (2017) validated the ASRM in a non-clinical sample. They argue that mania is a multifaced construct and that hypomania has a ‘bright side’ (active, elevated aspects) and a

'dark side' (irritable, risk-taking aspects). They suggest that the latter might not be covered by the five items of the ASRM. This might be reflected in the positive correlation of personal recovery and manic symptoms as well. The unconfirmed validity of the ASRM and the fact that the instrument might not measure all aspects of mania and hypomania in combination with the low reported manic symptoms in the current sample has led to the conclusion that manic symptoms might not be adequately detected and reflected in the current study. Future studies could benefit from utilizing other instruments and means to assess manic symptomatology.

A possibility to overcome the issue of the ASRM and self-reported manic symptoms, could be the use of clinician rated measures and administering Structural Clinical Interviews (SCID). Another option to assess manic symptomatology, could be the experience sampling method. This method reduces memory biases (Scollon et al., 2003) and measures symptoms over an extended period of time, which is well suited to reveal fluctuations in mood as they occur in BD.

Finally, the diagnoses of BD were self-reported and not assessed by a clinician. However, participants were recruited via the Dutch Patient Association for Bipolar Patients and 95% of the sample stated that they are currently taking medication regarding BD. This provides reason to believe that the vast majority of the sample actually was affected by BD.

Considering the current limitations, a starting point for future research should be to replicate these findings in longitudinal study designs using clinician rated assessments of symptomatology in samples with higher manic symptoms and possibly applying the experience sampling method. Another point for future research, could be to further investigate the role of responses to positive affect regarding personal recovery and symptomatology not only in BD but also in other diagnostic groups.

The current results suggest that persons with BD might use dampening and self-focused positive rumination in maladaptive ways to regulate their emotions. Persons with BD might benefit from treatments that integrate responses to positive affect. For example the intervention of Painter et al. (2019). They developed a positive emotion regulation intervention called Learning Affective Understanding for a Rich emotional Life (LAUREL). The aim of the intervention was to facilitate improvements in emotion dysregulation for people with BD and to foster positive emotions without triggering manic symptoms. Therefore, throughout the intervention, the importance of emotional balance was emphasised and patients learned practical skills such as mindfulness to create emotional balance (Painter et al., 2019). Another intervention focusing on positive emotion regulation in BD is an

intervention by Kraiss et al. (2018). Besides the reduction of dampening, self-compassion is facilitated as a healthy response to positive emotions and is positively associated with adaptive emotion regulation (Kraiss et al., 2018).

## Conclusion

The current study has been the first to investigate the mediating role of responses to positive affect between personal recovery and symptomatology in BD and suggests a mediation effect of dampening and self-focused positive rumination on the relationship of personal recovery and symptoms of mania. Limiting the findings is the cross-sectional design, preventing inference about causality and the direction of effects. Nevertheless, it seems that responses to positive affect constitute interesting mechanisms in BD and should be further investigated in longitudinal studies. Persons with BD might benefit from increasing attention towards responses to positive affect and a better understanding of the role they play in BD.

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