Master Thesis

# The Mediation Effect of Dampening on the Relation Between Symptomology of Bipolar Disorder and Well-Being

Franziska Strumann
University of Twente

Franziska Strumann
S2179903
Master Positive Psychology and Technology
Faculty of Behavioural, Management & Social Sciences
1st Supervisor: Peter ten Klooster
2nd Supervisor: Jannis Kraiss
Date 25.03.2020

**Abstract**

Well-being has shown to be a relevant factor in bipolar disorder (BD). It is not only associated with depressive symptoms of BD but also with manic symptoms. However, little is known about possible underlying mechanism between the symptomology (depressive/manic symptoms) and well-being. An important maintenance and onset factor of BD is emotion regulation. The main focus in research to date has been on the effects of the regulation of cognitive responses to negative affect, but less research has been done on the positive emotion regulation strategies: dampening, emotion-focused positive rumination and self-focused positive rumination. It has been shown that dampening is negatively associated with depressive symptoms and also with poorer well-being. Consequently, the present study investigated primary whether dampening mediates the relationship between symptomology and well-being. The secondary aim was to investigate whether different dimensions of positive affect regulation have a similar and independent mediation effect. Therefore, a cross-sectional survey study with 107 participants diagnosed with BD was performed. Results suggested that dampening did not mediate the relationship between symptomology (depressive/manic symptoms) and well-being. But the findings of the present study supported that emotion-focused positive rumination mediated the relationship between manic symptoms of BD and well-being. No other cognitive strategies to positive affect mediate the relationship. Emotion-focused positive rumination may play an important role in the maintenance of BD. However, results have to take with caution because longitudinal studies are needed to confirm the temporal nature of the mediation effect. Furthermore, treatment focusses on the responses to positive affect might be beneficial for people with BD.

*Keywords:* bipolar disorder, well-being, emotion regulation, dampening, positive rumination

## Introduction

Bipolar disorder (BD) is a chronic disorder characterized by recurring episodes of depression, manic and hypomanic episodes (Grande, Berk, Birmaher, & Vieta, 2016). In the Netherlands, the lifetime prevalence of BD is 1.3 % (De Graaf, ten Have, van Gool, & van Dorsselaer, 2011). The mood disorder is subdivided into BD I and BD II. To be diagnosed with BD I, one individual must at least experience one full-blown manic episode while BDI II is characterized by episodes of hypomanic and major depressive episodes (Grande et al., 2015). BD II has a higher prevalence and is more common in women (Nivoli et al., 2011). Furthermore, BD has an influence on different domains in life, especially through the depressive episodes which are more pervasive than the manic and hypomanic episodes (Ketter, 2010). The study of Merikangas et al. (2007) indicates that 87% of the patients with a depressive episode in the previous year show crucial impairments related to work, personal relationships, home responsibilities and social life. BD is a serious condition and is associated with reduced life expectation (Laursen, 2011) and reduced quality of life (Dean, Gerner, & Gerner, 2004). Also, the risk of suicide in BD individuals is 20-30 times higher than in the general population (Pompili et al., 2013). In addition, BD is associated with a high utilization of health-care related services (Dean et al., 2004) which amounted to an estimated total annual economic burden in the United States was 151 billion dollars in 2009 (Dilsaver, 2011).

In the past, mental health was generally considered as the absence of mental illness however recent research shows that other factors include and define the state of mental health. According to the two-continua model of mental health, which depicts one continuum with the absence or presence of mental illness and the other with the presence or absence of mental health (Westerhof & Keyes, 2009). One important factor of mental health is well-being (Keyes, 2002). Well-being is frequently divided into three dimensions. It consists of emotional well-being, which includes the presence of positive emotions and the absence of negative emotions. Another dimension is the psychological dimension, which refers for example to the experiencing purpose in life and having positive relationships. The last dimension is social well-being, which is comprised of social acceptance, social contribution and social integration (Keyes, 2002; Keyes, 2005). Research indicates that well-being is not only crucial for mental health, but also that well-being protects from the recurrence of mental illness (Schotanus-Dijkstra et al., 2016; Trompetter, deKleine & Bohlmeijer, 2017). Moreover, the absence of well-being has an influence on individuals shown for instance in the ten year cohort study by Wood and Joseph (2010) demonstrates that the absence of well-being is a risk factor for depression in an aging population.

Regarding BD and its influence of symptomology on quality of life, a study of Sierra, Livianos, and Rojo (2005) demonstrated that all patients with BD regardless of a depressive, hypomanic or manic episode had impairments in quality of life compared to the control population. Nevertheless, it is important to mention that patients with a manic or hypomanic state have less impairment in quality of life compared to patients with depressive symptoms (Vojta, Kinosian, Glick, Altshuler, & Bauer, 2001; Hayhurst, Palmer, Abbott, Johnson, & Scott, 2006). Quality of life is related to well-being as the study by Farquhar (1995) found out that in many studies, as it also defining well-being. Thus, it can be expected that patients with BD have not only impairments in quality of life, but also that the manic, hypomanic and depressive episodes impair their well-being.

An important maintenance and onset factor in BD is the way how people react to their affective state, which is also called emotion regulation (Nolen-Hoeksema, 1991). Emotion regulation is defined as the way in which individuals influence and modulate their emotions. The process occurs both conscious or unconscious and either automatic or controlled. In addition, both positive and negative emotions can be regulated (Gross, 1998). The main focus of research to date, has been on the effects of the regulation of cognitive responses to negative affect. Studies indicate that the cognitive response of rumination to negative affect predicts depressive symptoms and can even exacerbate depression (Johnson, McKenzie, & McMurrich, 2007; Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). However, less research has been done on the regulation of cognitive responses of the individuals to positive affect.

Feldman, Joormann, and Johnsons (2008) differentiate between three cognitive strategies to respond to positive affect, namely; dampening and two forms of positive rumination: self-focused and emotion-focused positive rumination. Dampening is described as the suppression of positive emotions and affect with the goal to reduce a positive feeling, event or state. One example of dampening is the thought ‘I do not deserve it’ as reaction to a positive experience. Positive rumination includes repetitive thoughts about positive feelings and experiences and the goal is to increase positive mood. Self-focused positive rumination contains rumination about aspects of the self and personally relevant goals and includes thoughts such as ‘I live completely according to my abilities and possibilities’ or ‘I get everything I want to achieve for each other’. Emotion-focused positive rumination is described as the rumination of somatic experiences and positive mood and an example statement is thinking about ‘I feel happy’. (Feldman et al., 2008).

Studies in general populations demonstrate that dampening of positive affect is related to more depressive symptoms. Individuals who use more dampening endorse more depressive

symptoms and show lower self-esteem (Feldman et al., 2008; Raes, Daems, Feldman, Johnson, & Van Gucht, 2010). In addition, more dampening was moderately associated with reduced personal recovery and weakly with lower well-being in BD patients (Kraiss et al., 2019). In line with that, the strategy of dampening is associated with poorer well-being and more dampening is related to lower quality of life (Quoidbach, Berry, Hansenne, & Mikolajczak, 2010; Edge et al., 2013). Dampening is seen as a maladaptive strategy because of its influence on depressive symptoms (Gilbert, Nolen-Hoeksema, & Gruber, 2013). Furthermore, the study of Edge et al. (2013) indicates that dampening is higher in patients with BD compared to controls.

Regarding positive rumination, studies demonstrate that positive rumination is also related to the symptomology of BD. The study of Feldman et al. (2008) indicates that manic symptoms are associated with positive rumination. Results showed that higher levels of manic symptoms are associated with more use of self-focused positive rumination (Feldman et al., 2008). Furthermore, the study of Johnson and Jones (2009) shows that individuals with a history of mania use more cognitive strategies that involve the focus on positive affect than individuals without a history of mania. In addition, the study indicated that self-focused positive rumination is positively related to current manic symptom severity (Johnson & Jones, 2009). Furthermore, positive rumination is positively associated with different facets of well-being such as life satisfaction and positive affect (Quoidbach et al., 2010). Striking is that both well-being and manic symptoms are positive associated with positive rumination, although previous research indicated that manic symptoms lead to impairments of well-being (Sierra et al., 2005).

Thus, studies of cognitive strategies of positive emotion regulation suggest that there might be an association with the symptomology of BD. Moreover, prior studies indicate that the regulation of cognitive responses to positive affect has an influence on well-being. However, to our knowledge no research has been conducted on the mediation effect of response to positive affect. Research does however provide indications that cognitive responses to positive affect may have a mediation effect on the relation of symptomology of BD and well-being, because of the conflicting results of positive associations of positive rumination with well-being and manic symptoms. A comparable study of Raes (2010) suggests that brooding, a negative rumination strategy characterized by thinking about oneself in a critical way, arises as the mediator on the relationship between depression and self-compassion in students. Since self-compassion is strongly associated to psychological health

thus well-being (Neff, 2009), a similar mediation effect could occur through cognitive strategies of positive emotion regulation.

Taken together, previous studies suggest an association between symptomology of BD and well-being. Depressive symptoms as well as manic symptoms lead to impairments of well-being (Sierra et al., 2005). In addition, there are different strategies to regulate positive affect, which are also related to the symptomology of BD and well-being (Feldman et al., 2008; Gilbert et al., 2013; Quoidbach et al., 2010). However, there is a gap in research on the mediation effect of cognitive responses to positive affect. It is important to investigate the role of cognitive emotion regulation to positive affect to gain knowledge about these mechanisms to improve treatment. Recent psychological treatment in BD includes cognitive-behavioural therapy (CBT), family-focused therapy, interpersonal and social rhythm therapy, family-focused therapy, group psychoeducation, and systematic care management (Geddes & Miklowitz, 2013). Focus in CBT lies on the negative and pessimistic thoughts and the dysfunctional core beliefs about the self, future and world (Beck, Rush, Shaw, & Emery, 1987). Moreover, CBT was adapted for BD relating to focussing on overly optimistic thinking, but also on modifying behaviour to prevent relapse and to detect early symptoms of an episode (Lam, Hayward, Watkins, Wright, & Sham, 2005).

Another important domain in mental health services which is increasingly considered over the last decades is positive psychology. A central focus of positive psychology is the increase in well-being (Slade, 2010). The study by Fava and Ruini (2003) suggests that in mood disorder, well-being therapy is an effective additional component of CBT in patients who do not respond to standard psychological or pharmacological treatment. In addition, individuals with severe mental illness, such as BD, remark dissatisfaction with the primary targets of treatment and instead ask for the signification of personal recovery outcomes (Pitt, Kilbride, Nothard, & Welford, 2007; Mead & Copeland, 2000; Jones, Higginson, Murray, & Morrison, 2010). Due to the suggestion that cognitive responses to positive affect may have an influence on well-being, recent psychology treatment concerning positive psychology might benefit of the knowledge and current psychological treatment may improve.

Especially dampening is seen as a maladaptive strategy as it endorses depressive symptoms (Gilbert et al., 2013) and is associated with poorer well-being (Quoidbach et al., 2010), and thus may need to be more focussed on treatment.

Therefore, the primary aim of the present study is to examine whether dampening mediates the relationship between symptomology and well-being in patients with BD. The secondary aim is to investigate whether different dimensions of positive emotion regulation

(including dampening, emotion-focused positive rumination, self-focused positive rumination) have a similar and independent mediation effect on the relationship between symptomology and well-being in patients with BD.

## Method

### Participants and Procedure

The present study is a post-hoc analysis of cross-sectional data in a questionnaire validation study (Kraiss et al., 2019). The participants were recruited through the Dutch patient association for bipolar patients and their relatives. Respondents were recruited via advertisement in the newsletter of the patient association and an email was sent to all members of the patient association. Thus, respondents participated voluntarily. Participants were asked to fill in an online survey conducted with the online survey program LimeSurvey (https://www.limesurvey.org). At the beginning of the study, participants were informed about their right to stop with the study whenever they wanted to and about the anonymity and confidentiality of the study. The instructions were at the beginning of each questionnaire. The survey contained also other questionnaires (QPR, s-SRPQ), but these will not be included in the current analyses. The time to get through the survey was approximately 15-20 minutes. After completing the study, participants could leave their email address for taking part in the lottery, because among all participants, 20 vouchers a 10 euro each were raffled.

### Measures

1. **Demographic data**

Demographic data included age, gender, marital and employment status and education. Participants also had to specify their diagnosis (BD I and BD II) and they were asked if they were in psychiatric or psychological treatment at the time of participation and if they were taking medication because of their diagnosis of BD.

2. **Depression symptoms**

Depression symptoms were measured with the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983). The scale consists of 14 items and rates the presence of psychopathology in two domains: depressive symptoms (seven items) and anxiety (seven items). Participants rated the frequency of symptoms over the last week, whereby 1 indicates not at all and 3 very often. Only the seven items of the depression subscale were used. Higher

scores indicate more psychopathology. The test-retest reliability is good and the internal consistency of the depression subscale has been shown to be acceptable in a sample of different Dutch patient groups of young adults and elderly ($\alpha$ = .79) (Spinhoven et al., 1997). Cronbach's $\alpha$ was .73 for the depression subscale in the current study.

**3. Manic symptoms**

To measure manic symptoms, participants were asked to fill in the Altman Self-Rating Mania Scale (ASRM; Altman, Hedeker, Peterson, & Davis, 1997). The ASRM is a self report scale of five items which measures the symptoms of mania in the past week. Symptoms of mania include, for example, increased cheerfulness or inflated self-confidence. Each item consists of five response options with increasingly severe descriptions. Summing up the scores of each item results in total scores. The test-retest reliability of the ASRM is good and the internal consistency is high (Altman et al., 1997). Cronbach's $\alpha$ was .73 in the present study.

**4. Response to positive affect**

Responses to positive affect were measured with the Reponses to Positive Affect Scale (RPA; Feldman et al., 2008; Raes, Daems, Feldman, Johnson, & Van Gucht, 2010) which consists of 17 items measuring three subscales: (1) Emotion-focused positive rumination (five items), (2) Dampening (eight items) and (3) Self-focused positive rumination (four items). The questionnaire assesses cognitive responses to positive affective states on a 4-point Likert-scale, which ranges from 1 (almost never) until 4 (almost always). In a previous psychometric evaluation in a sample of first-year Belgian Psychology students, the internal consistency across the three subscales (.72 – .80) was acceptable to good and Cronbach's $\alpha$ was .72 for the subscale emotion-focused positive rumination and for the subscales dampening and self-focused positive rumination .80 (Raes et al., 2010). In the current study, Cronbach's $\alpha$ was .77 for the subscales dampening, and .80 for the subscales emotion-focused positive rumination and self-focused positive rumination.

**5. Well-being**

The Dutch version of the Mental Health Continuum- Short Form (MHC-SF; Lamers, Westerhof, Bohlmeijer, ten Klooster, & Keyes, 2011) measures well-being of the participants. It is a 14-item self-report questionnaire and rates well-being on three dimensions: (1) emotional well-being, (2) psychological well-being and (3) social well-being. Participants rate

the frequency of feelings in the past month on a 6-point Likert-scale, ranging from 1 (never) to 6 (every day). The MHC-SF has a high internal consistency and a moderate test-retest reliability (Lamers et al., 2011). In the current study, Cronbach's $\alpha$ was .84 for the total scale.

**Data-analysis**

All analyses were performed using the statistical program SPSS 21.0. The questionnaire data HADS, ASRM, RPA and MHC-SF were visually inspected for participants who did not fill in the questionnaires.

Mediational pathways between symptomology and well-being were tested using the PROCESS macro for SPSS by Hayes (http://processmacro.org) which uses bootstrapping.

In the mediation analyses, the dependent variable was well-being and the independent variable was symptomology of BD (depressive symptoms or manic symptoms). The bias-corrected nonparametric bootstrapping method of 5,000 samples was used to analyse the extent to which symptomology of BD on well-being is mediated through cognitive response to positive emotion. The technique of bootstrapping was used, because of its high statistic power and controls more accurate for type I faults (Hayes, 2009). Indirect and direct effects were measured between the predictor and outcome variables. The mediation effect is significant if the 95 % bootstrapped confidence intervals does not contain zero.

Firstly, simple mediation models were conducted to examine the role of dampening in the relation between symptomology and well-being. Then multiple mediation models that simultaneously examine the role of the three positive emotion regulations in mediating the relation between symptomology and well-being were constructed to examine if the other factors have possible similar indirect effects. The direct effect (c') is the effect of symptomology of BD on well-being while keeping the mediator(s) constant. Total effects were measured by the sum of the indirect and direct effects.

## Results

A sample of 82 women and 25 men with a mean age of 52 (SD= 11.23, range 23-77) filled in the survey. 89 % of them were currently in psychological of psychiatric treatment. Table 1 shows the demographics and characteristics of the sample and Table 2 presents the bivariate correlations of the variables' symptomology (depressive and manic symptoms), dampening, emotion-focused positive rumination, self-focused positive rumination and well-being.

Table 1
*Demographics and characteristics of the sample (N=107)*

| Demographic | N | % |
|---|---|---|
| Age | | Mean = 52 (Range 23-77) |
| Gender | | |
| Male | 25 | 23.4 |
| Female | 82 | 76.6 |
| Education | | |
| Low | 14 | 13.1 |
| Moderate | 35 | 32.7 |
| High | 57 | 53.3 |
| Missing | 1 | .9 |
| Work status | | |
| Paid Work | 26 | 24.3 |
| Unable to work | 39 | 36.4 |
| Retired | 10 | 9.3 |
| Student | 3 | 2.8 |
| Other | 29 | 27.2 |
| Marital Status | | |
| Married | 56 | 52.3 |
| Never married | 28 | 26.2 |
| Divorced | 22 | 20.6 |
| Widowed | 1 | .9 |
| Diagnosis | | |
| BDI I | 42 | 39.3 |
| BDI II | 51 | 47.7 |
| Unknown | 14 | 13.0 |
| Currently in treatment | | |
| Yes | 89 | 83.2 |
| No | 18 | 16.8 |
| How often treatment | | |
| Once | 14 | 13.1 |
| 2-3 times | 43 | 40.2 |
| 4-6 times | 15 | 14.0 |
| 7-12 times | 7 | 6.5 |
| More than 12 times | 10 | 9.3 |
| Unknown | 18 | 16.8 |
| Currently taking medication | | |
| Yes | 102 | 95.3 |
| No | 5 | 4.7 |
| Relapse in the past 6 months | | |
| Yes | 59 | 55.1 |
| No | 48 | 44.9 |

Table 2

*Bivariate correlations of the variables*

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| 1. Depressive Symptoms | | -.205 | .215* | -.388** | -.192 | -.682** |
| 2. Manic Symptoms | | | .149 | .187 | .342** | .201* |
| 3. Dampening | | | | -.210* | -.093 | -.251* |
| 4. Emotion-Focused | | | | | .622** | .412** |
| 5. Self-Focused | | | | | | .199* |
| 6. Well-Being | | | | | | |

*p≤.05, **p≤.01.

**Univariate analyses**

To investigate if dampening mediates the relationship between symptomology and well-being a simple mediation analysis was performed. The path of depressive symptoms to dampening was positive and statistically significant (b=.229, SE=.106, p<.05), indicating that persons scoring higher on depressive symptoms on average were more likely to use the cognitive response to dampen their positive emotions than those scoring lower on the measure. The path of dampening to well-being also proved to be significant to note (b=-2.357, SE=.273, p<.001).

The indirect effect of depressive symptoms on well-being was found not to be significant (ab=-0.119, 95% CI [-0.302, 0.021]). This shows that there is no simple mediation effect of dampening on the relation of depressive symptoms and well-being.

The second model investigates if dampening mediates the relationship between symptomology and well-being. The indirect effect of manic symptoms on well-being was found to be not statistically significant (ab=-.220, CI [-.596, .014]), thus there is no simple mediation effect of dampening on the relation between manic symptoms and well-being.

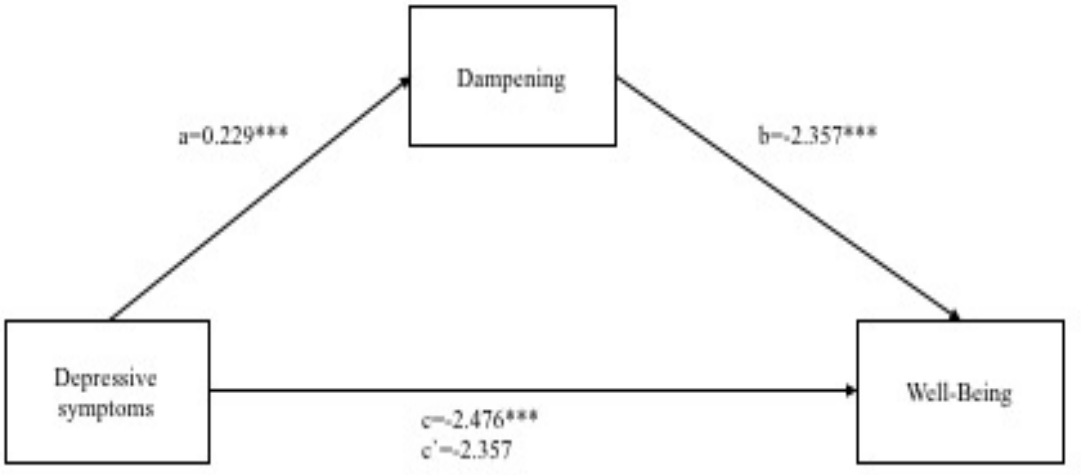


**Figure 1.** The simple mediation model (N=98) including the total effect (c) and the direct effect (c') of depressive symptoms on well-being and the indirect effect (ab) of dampening. Note: Beta-coefficients are unstandardized. ***p < .001

**Multivariate Analyses**

To investigate if cognitive responses to positive emotion (dampening, emotion-focused positive rumination, self-focused positive rumination) similarly mediate the relationship between symptomology of BD and well-being, multiple mediation analyses were conducted. In the first model only the pathways depressive symptoms to dampening and depressive symptoms to emotion-focused positive rumination were significant (b=.229, SE=.106, p<.05; b=-.291, SE=.070, p<.001). Furthermore, the model demonstrated that there is no indirect effect of all three cognitive responses to positive affect, indicating that none of the three cognitive responses significantly mediate the relationship between depressive symptoms and well-being.

In the second model (Figure 2), it was found out that the effects of manic symptoms on response to positive affect (including dampening, emotion-focused positive rumination and self-focused positive rumination) and overall well-being were significant. Nevertheless, the results show that only emotion-focused positive rumination is the strategy that significantly mediated the relationship of manic symptoms on well-being (ab=.359, 95% CI [0.000, 0.789]). The indirect effects of the multiple mediation model can be seen in Table 3 and 4.

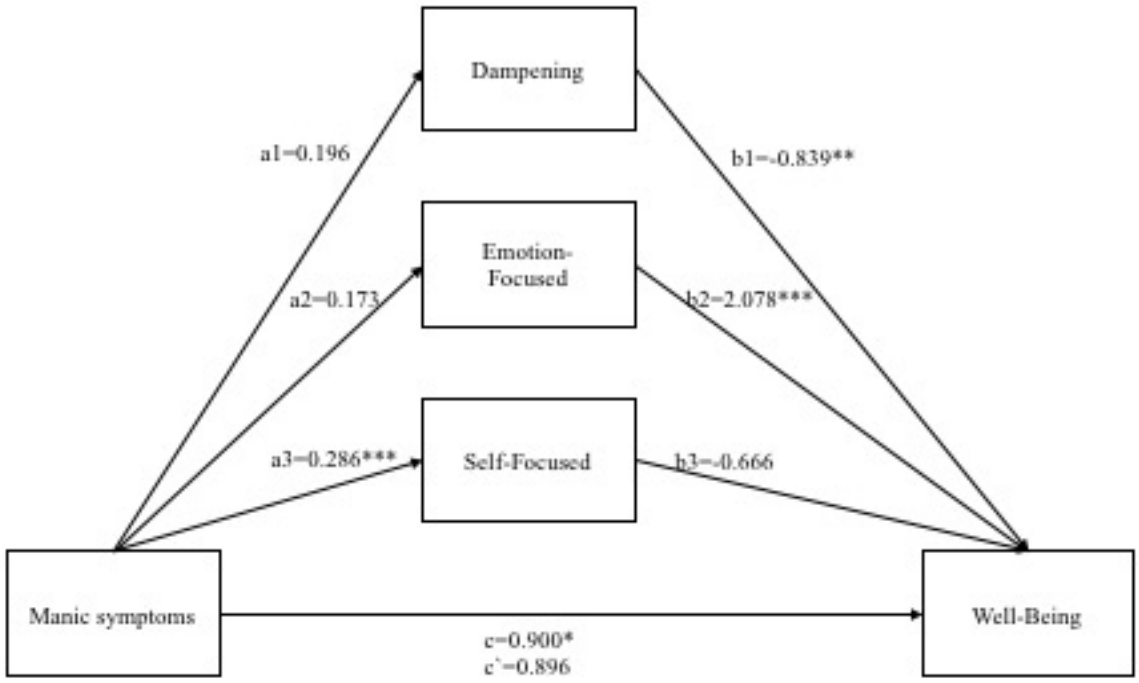


**Figure 2.** The multiple mediation model (N=98) including the total effect (c) and the direct effect (c') of manic symptoms on well-being and the indirect effects (ab) of dampening, self-focused positive rumination and emotion-focused positive rumination.

Notes: Beta-coefficients are unstandardized. *p < .05, **p < .01, ***p < .001

Table 3

*Indirect effects of multiple mediation models (Depressive symptoms as IV)*

| Mediator | Effect | Boot SE | BootLLCI | BootULCI |
|---|---|---|---|---|
| Dampening | -.101 | .083 | -.288 | .045 |
| Self-Focused | .008 | .064 | -.141 | .125 |
| Emotion-Focused | -.273 | .162 | -.639 | .009 |

Notes: IV=Independent Variable

Table 4

*Indirect effects of multiple mediation models (Manic symptoms as IV)*

| Mediator | Effect | Boot SE | BootLLCI | BootULCI |
|---|---|---|---|---|
| Dampening | -.164 | .130 | -.491 | .008 |
| Self-Focused | -.190 | .223 | -.643 | .241 |
| Emotion-Focused | .359 | .205 | .000 | .789 |

Notes: IV=Independent Variable

## Discussion

The goal of the present study was to gain insight into positive affect regulation in BD. Therefore, the primary aim of the study was to examine if dampening mediates the relationship between symptomology of BD and well-being. Results showed that dampening did not mediate the relationship between depressive symptoms and well-being nor the relation between manic symptoms and well-being. The secondary aim was to investigate whether different dimensions of positive affect regulation (including dampening, emotion-focused positive rumination, self-focused positive rumination) have a similar and independent mediation effect on the relationship between symptomology and well-being. The results of the study indicated that there is no mediation effect on the relation between depressive symptoms and well-being, but it was shown that emotion-focused positive rumination mediated the relationship of manic symptoms and well-being.

Regarding the primary aim of the study, prior research indicated that there is a link between symptoms of BD and well-being. Especially depressive symptoms are associated with impairments in well-being (Sierra et al., 2005). This association is consistent with the present study in which a moderate negative correlation between depressive symptoms and well-being was found. Previous studies also showed that negative rumination is a predictor and intensifier of depressive symptoms (Nolen-Hoeksema, 2000) and mediates the relation between depression and self-compassion in students (Raes, 2010). Furthermore, individuals with BD have an increased use of negative rumination compared to a healthy control condition (Wolkenstein, Zwick, Hautzinger, & Joormann, 2014). The results of the present study are not consistent with these findings which indicate that dampening also might to be a possible mediator on the relation between depressive symptoms and well-being. The findings of the present study suggest that there is an association between depressive symptoms and well-being, but that dampening may have not enough influence to mediate the already strong relationship between depressive symptoms and well-being. This is in line with the study by Vojta et al. (2001) which indicates that the primary determinant of quality of life in BD seems to be depressive symptoms. As already mentioned, quality of life is related to well-being (Farquhar, 1995), which suggests that depressive symptoms might also be the primary determinant of well-being in BD. Another core mechanism involved in maintaining depressive cognitive styles is rumination of negative affect (Nolen-Hoeksema, Parker, & Larson, 1994). Furthermore, several studies demonstrate that depression is related to decreased attention to positive stimuli (Rottenberg, Kasch, Gross, & Gotlib, 2002; Henriques & Davidson, 2000) which might indicate that also the focus on cognitive response of positive

emotions might be decreased and therefore other mechanism with a focus on cognitive response of negative affect, such as negative rumination play a more important role in patients with depressive symptoms.

In addition, results demonstrated that dampening did not mediate the relation between manic symptoms and well-being. First of all, it is important to mention that results of the current study showed only a weak direct positive correlation between manic symptoms and well-being. Due to the fact that dampening is seen as a maladaptive strategy and is negatively associated with depressive symptoms (Gilbert et al., 2013), it might be the case that manic symptoms are not noteworthy related to dampening, although some people who are vulnerable to manic symptoms are likely to prevent episodes of mania (Lam & Wong, 1997) and might use the strategy of dampening to reduce positive feelings. A possible explanation might be that there is a difference of the appearance of dampening in manic symptoms. Maybe, the increase of manic symptoms results in a decrease of dampening and thus the effect on the relationship between manic symptoms and well-being is dissolved.

Regarding the secondary aim of the present study, results showed that emotion-focused positive rumination was the only positive emotion regulation strategy which mediates the relation of manic symptoms and well-being. This finding is in line with the research by Feldman et al. (2008). The research by Feldman et al. (2008) suggests that there is an association between the vulnerability of mania and the choice of cognitive strategies that increase positive emotions through emotion-focused positive rumination and to a lesser extent through self-focused positive rumination. However, they did not find a mediation effect. Compared to the present study, it is suggested that manic symptoms increase the use of the emotion-focused positive rumination strategy which in turn increases well-being. This mediation effect was not found in the relation between depressive symptoms and well-being. One possible explanation is again that it can be also assumed that depressive symptoms and well-being are so strongly related to each other in this population and other factors can not influence the relationship.

There are some limitations of the study that have to be mentioned. First of all, the present study is a cross-sectional study which means that the results should be interpreted with caution because of the fact that no causality and direction of the effect can be concluded. It is important to examine the temporal nature mediation effects (O'Laughlin, Martin, & Ferrer, 2018). Therefore, a longitudinal study would be necessary.

Furthermore, longitudinal studies are meaningful for future studies to investigate whether positive affect regulation might change over time of treatment. Regarding the fact

that the effects of the regulation of cognitive responses to negative affect are researched and that this mechanism is a core mechanism in patients with BD (Johnson et al., 2007; Noelen-Hoeksema et al., 1994), there might be changes regarding the use of cognitive responses of negative and positive affect during treatment. It would also be interesting to investigate whether addressing positive emotion regulation from the start of treatment would lead to changes in well-being. For example, the study of Raes, Smets, Nelis and Schoofs (2012) shows that the significant association between depressive symptoms and brooding, a negative rumination strategy, disappeared when regulation of positive emotion was considered.

Another limitation of the study is the use of the ASRM which assesses manic symptoms of the patients with BD over the past week. The self-reported questionnaire consists of five items, which include increased cheerfulness and self-confidence. Self-confidence and also cheerfulness are related to well-being (Oishi, Diener, & Lucas, 2009; Pettersson, 2018), thus there might be overlap between the questionnaire of ASRM and well-being. Furthermore, the study of Bauer et al. (1991) found out that the core symptom of hypomanic and manic episodes is an increased activity of individuals instead of increased positive mood. Regarding the ASRM, there is only one item which measures the activity of individuals. It is striking that individuals only have to have an increase of activity in one domain of their life, for example an increase of activity at work or heightened sexual behaviour, thus it might be easier to score high on the item and to fulfil the criteria for manic symptoms. For future research, it is important to use a different valid measuring to examine manic symptoms. Because of the fact that the ASRM is based on self-report and self-report might not be appropriate for manic symptoms, another format should be used. A possibility to overcome the issue, the study by Miller, Johnson and Eisner (2009) examined the different assessment tools for the BD diagnosis and found out that the most common measurements of manic symptoms are clinical-rated interviews. The researchers examined different interviews and indicate that the SCID and the SADS are meaningful measure, because the measurements are semistructured interviews and have excellent psychometric characteristics for the assessment of BD I (Miller et al., 2009). For future research, it is important to use one of these interviews.

In addition, the diagnosis of the sample was received through self-report, which implies that not all patients had a diagnosis confirmed through a clinical professional. Therefore, additional diagnostic tools are necessary to provide more accurate results and findings. However, 89% of the sample are currently in treatment for BD, which indicates that the diagnosis has already been discussed and researched with the responsible practitioner.

Because of the fact that the present study was one of the first studies which focussed on cognitive responses to positive affect in BD patients, it is important to further explore the topic of cognitive response to positive affect to improve psychological treatment concerning CBT. The study of Raes et al. (2012) suggests that the regulation of positive affect has an influence on depressive symptoms and therefore this topic should be explored more in detail, to possible integrate and focus these strategies in CBT, besides focussing only on negative cognition and negative emotion regulation. There are some studies and interventions besides CBT which focus on the experience of positive affect in people with BD (Painter et al., 2019). In periods of symptom remission, focusing on positive emotion regulation, such as modulating positive emotion, may help people with BD in experiencing positive affect (Carl, Gallagher, & Barlow, 2018). Furthermore, the study by Kraiss et al. (2018) developed a randomized control trail of a positive psychology group intervention for people with BD in symptom remission, including the focus on positive emotion regulation such as positive emotions and personal strengths. Therefore, the present study gives indications which cognitive strategy of positive rumination to positive affect should be target more or less. The present findings suggest that emotion-focused positive rumination mediates the relationship between manic symptoms and well-being, therefore it may be important to focus more on this kind of strategy on treatment. In addition, the findings indicate that emotion regulation to positive affect has impact on the well-being of people with BD and therefore should be investigated further to adapt treatment, because persons may benefit from such interventions.

Furthermore, the current study demonstrated that dampening did not influence the relationship between symptomology and well-being. However, dampening should also be target in treatment because of the fact that it is seen as a maladaptive strategy because of its influence on depressive symptoms (Gilbert, Nolen-Hoeksema, & Gruber, 2013).

Regarding the fact that in the present study only total scores of well-being were calculated, it might be also interesting to differentiate between the three dimensions of well-being: emotional, social and psychological well-being. Considering the results of the present study, there might be differences of emotion-focused positive rumination as mediator on the three different dimensions of well-being.

In conclusion, the present study showed that cognitive response to positive affect plays a role in people with BD. More precisely, emotion-focused positive rumination mediates the relation between manic symptoms and well-being. Therefore, the study provides more insight about the field of cognitive responses to positive affect. Determining possible factors and

mechanisms can lead to CBT being adjusted with positive psychology interventions in BD patients.

References


Altman, E. G., Hedeker, D., Peterson, J. L., & Davis, J. M. (1997). The Altman self-rating mania scale. *Biological Psychiatry, 42*(10), 948–955.

Bauer, M. S., Crits-Christoph, P., Ball, W. A., Dewees, E., McAllister, T., Alahi, P., ... Whybrow, P. C. (1991). Independent Assessment of manic and depressive symptoms by self-rating. *Archives of General Psychiatry, 48*(9), 807. doi:10.1001/archpsyc.1991.01810330031005

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1987). Cognitive therapy of depression. Retrieved from https://books.google.de/books?hl=de&lr=&id=L09cRS0xWj0C&oi

Carl, J. R., Gallagher, M. W., & Barlow, D. H. (2018). Development and Preliminary Evaluation of a Positive Emotion Regulation Augmentation Module for Anxiety and Depression. *Behavior Therapy, 49*(6), 939–950. doi:10.1016/j.beth.2017.11.008

Dean, B. B., Gerner, D., & Gerner, R. H. (2004). A systematic review evaluating health-related quality of life, work impairment, and healthcare costs and utilization in bipolar disorder. *Current Medical Research and Opinion, 20*(2), 139–154. doi:10.1185/030079903125002801

De Graaf, R., ten Have, M., van Gool, C., & van Dorsselaer, S. (2011). Prevalence of mental disorders and trends from 1996 to 2009. Results from the Netherlands Mental Health Survey and Incidence Study-2. *Social Psychiatry and Psychiatric Epidemiology, 47*(2), 203–213. doi:10.1007/s00127-010-0334-8

Dilsaver, S. C. (2011). An estimate of the minimum economic burden of bipolar I and II disorders in the United States: 2009. *Journal of Affective Disorders, 129*(1-3), 79–83. doi:10.1016/j.jad.2010.08.030

Edge, M. D., Miller, C. J., Muhtadie, L., Johnson, S. L., Carver, C. S., Marquinez, N., & Gotlib, I. H. (2013). People with bipolar I disorder report avoiding rewarding activities and dampening positive emotion. *Journal of Affective Disorders, 146*(3), 407–413. doi:10.1016/j.jad.2012.07.027

Farquhar, M. (1995). Definitions of quality of life: a taxonomy. *Journal of Advanced Nursing, 22*(3), 502–508. doi:10.1046/j.1365-2648.1995.22030502.x

Fava, G. A., & Ruini, C. (2003). Development and characteristics of a well-being enhancing psychotherapeutic strategy: well-being therapy. J*ournal of Behavior Therapy and Experimental Psychiatry, 34*(1), 45–63. doi:10.1016/s0005-7916(03)00019-3

Feldman, G. C., Joormann, J., & Johnson, S. L. (2008). Responses to positive affect: A self-report measure of rumination and dampening. *Cognitive Therapy and Research, 32*(4), 507–525. https://doi.org/10.1007/s10608-006-9083-0

Grande, I., Berk, M., Birmaher, B., & Vieta, E. (2016). Bipolar disorder. *The Lancet, 387*(10027), 1561–1572. doi:10.1016/s0140-6736(15)00241-x

Geddes, J. R., & Miklowitz, D. J. (2013). Treatment of bipolar disorder. *The Lancet, 381*(9878), 1672–1682. doi:10.1016/s0140-6736(13)60857-0

Gilbert, K. E., Nolen-Hoeksema, S., & Gruber, J. (2013). Positive emotion dysregulation across mood disorders: How amplifying versus dampening predicts emotional reactivity and illness course. *Behaviour Research and Therapy, 51*(11), 736–741. doi:10.1016/j.brat.2013.08.004

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(3), 271-299.

Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical Mediation Analysis in the New Millennium. *Communication Monographs*, *76*(4), 408-420. doi:10.1080/03637750903310360

Hayhurst, H., Palmer, S., Abbott, R., Johnson, T., & Scott, J. (2006). Measuring health-related quality of life in bipolar disorder: Relationship of the EuroQol (EQ-5D) to condition-specific measures. *Quality of Life Research, 15*(7), 1271–1280. doi:10.1007/s11136-006-0059-z

Henriques, J. B., & Davidson, R. J. (2000). Decreased responsiveness to reward in depression. *Cognition & Emotion, 14*(5), 711–724. doi:10.1080/026999300501176 84

Johnson, S. L., & Jones, S. (2009). Cognitive correlates of mania risk: Are responses to success, positive moods, and manic symptoms distinct or overlapping? *Journal of Clinical Psychology, 65*(9), 891–905. https://doi.org/10.1002/jclp.20585

Johnson, S. L., McKenzie, G., & McMurrich, S. (2008). Ruminative Responses to Negative and Positive Affect Among Students Diagnosed with Bipolar Disorder and Major Depressive Disorder. *Cognitive Therapy and Research, 32*(5), 702–713. doi:10.1007/s10608-007-9158-6

Jones S, Higginson S, Murray C, Morrison AP, editors. Recovery Experiences in Bipolar Disorder. Manchester: Proceedings of The British Association for Behavioural and Cognitive Psychotherapy Annual Conference; 2010.

Ketter, T. A. (2010). Diagnostic Features, Prevalence, and Impact of Bipolar Disorder. *The Journal of Clinical Psychiatry, 71*(06), e14. doi:10.4088/jcp.8125tx11c

Keyes, C.L.M. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of Health and Social Behavior, 43*(2), 207–222.

Keyes, C.L.M. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of Consulting and Clinical Psychology, 73*(3), 539–548.

Kraiss, J. T., ten Klooster, P. M., Chrispijn, M., Stevens, A. W. M. M., Kupka, R. W., & Bohlmeijer, E. T. (2019). Psychometric properties and utility of the Responses to Positive Affect questionnaire (RPA) in a sample of people with bipolar disorder. *Journal of Clinical Psychology, 75*(10), 1850–1865. doi:10.1002/jclp.22819

Kraiss, J. T., ten Klooster, P. M., Chrispijn, M., Trompetter, H. R., Stevens, A. W. M. M., Neutel, E., … Bohlmeijer, E. T. (2018). B-positive: a randomized controlled trial of a multicomponent positive psychology intervention for euthymic patients with bipolar disorder - study protocol and intervention development. *BMC Psychiatry, 18*(1). doi:10.1186/s12888-018-1916-3

Lam, D. H., Hayward, P., Watkins, E. R., Wright, K., & Sham, P. (2005). Relapse Prevention in Patients With Bipolar Disorder: Cognitive Therapy Outcome After 2 Years. *American Journal of Psychiatry, 162*(2), 324–329. doi:10.1176/appi.ajp.162.2.324

Lam, D., & Wong, G. (1997). Prodromes, coping strategies, insight and social functioning in bipolar affective disorder. *Psychological Medicine, 27*(5), 1091-1100. doi:10.1017/s0033291797005540

Lamers, S., Westerhof, G. J., Bohlmeijer, E. T., Ten Klooster, P. M., & Keyes, C. L. (2011). Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF). *Journal of Clinical Psychology, 67*(1), 99–110.

Laursen, T. M. (2011). Life expectancy among persons with schizophrenia or bipolar affective disorder. *Schizophrenia Research, 131*(1-3), 101–104. doi:10.1016/j.schres.2011.06.008

Mead, S., & Copeland, M.E. (2000). What recovery means to us: consumers' perspective. *Community Mental Health Journal, 36*(3), 315-28. doi: 10.1023/A:1001917516869

Merikangas, K. R., Akiskal, H. S., Angst, J., Greenberg, P. E., Hirschfeld, R. M. A., Petukhova, M., & Kessler, R. C. (2007). Lifetime and 12-Month Prevalence of Bipolar Spectrum Disorder in the National Comorbidity Survey Replication. *Archives of General Psychiatry, 64*(5), 543. doi:10.1001/archpsyc.64.5.543

Miller, C. J., Johnson, S. L., & Eisner, L. (2009). Assessment Tools for Adult Bipolar Disorder. *Clinical Psychology: Science and Practice, 16*(2), 188–201. doi:10.1111/j.1468-2850.2009.01158.x

Neff, K. D. (2009). Self-Compassion. In M. R. Leary & R. H. Hoyle (Eds.), *Handbook of Individual Differences in Social Behavior* (pp. 561– 573). New York: Guilford Press.

Nivoli, A. M. A., Pacchiarotti, I., Rosa, A. R., Popovic, D., Murru, A., Valenti, M., … Colom, F. (2011). Gender differences in a cohort study of 604 bipolar patients: The role of predominant polarity. *Journal of Affective Disorders, 133*(3), 443–449. doi:10.1016/j.jad.2011.04.055

Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology, 100*(4), 569-582.

Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology, 109,* 504-511. doi:10.1037/0021-843x.109.3.504

Nolen-Hoeksema, S., Parker, L. E., & Larson, J. (1994). Ruminative coping with depressed mood following loss. *Journal of Personality and Social Psychology, 67*(1), 92–104. doi:10.1037/0022-3514.67.1.92

Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking Rumination. *Perspectives on Psychological Science, 3*(5), 400–424. doi:10.1111/j.1745-6924.2008.00088.x

Oishi, S., Diener, E., & Lucas, R. E. (2009). The optimum level of well-being: Can people be too happy? *The Science of Well-Being,* 175–200. doi:10.1007/978-90-481-2350-6_8

O'Laughlin, K. D., Martin, M. J., & Ferrer, E. (2018). Cross-Sectional Analysis of Longitudinal Mediation Processes. *Multivariate Behavioral Research, 53*(3), 375–402. doi:10.1080/00273171.2018.1454822

Painter, J. M., Mote, J., Peckham, A. D., Lee, E. H., Campellone, T. R., Pearlstein, J. G., … Moskowitz, J. T. (2019). A positive emotion regulation intervention for bipolar I disorder: Treatment development and initial outcomes. *General Hospital Psychiatry, 61*, 96–103. doi:10.1016/j.genhosppsych.2019.07.013

Pettersson, C. (2018). Psychological well-being, improved self-confidence, and social capacity: bibliotherapy from a user perspective. *Journal of Poetry Therapy, 31*(2), 124–134. doi:10.1080/08893675.2018.1448955

Pitt, L., Kilbride, M., Nothard, S., Welford, M., & Morrison, A. P. (2007). Researching recovery from psychosis: a user-led project. *Psychiatric Bulletin, 31*(2), 55–60. doi:10.1192/pb.bp.105.008532

Pompili, M., Gonda, X., Serafini, G., Innamorati, M., Sher, L., Amore, M., … Girardi, P. (2013). Epidemiology of suicide in bipolar disorders: a systematic review of the literature. *Bipolar Disorders, 15*(5), 457–490. doi:10.1111/bdi.12087

Quoidbach, J., Berry, E. V., Hansenne, M., & Mikolajczak, M. (2010). Positive emotion regulation and well-being: Comparing the impact of eight savoring and dampening strategies. *Personality and Individual Differences, 49*(5), 368–373. doi:10.1016/j.paid.2010.03.048

Raes, F. (2010). Rumination and worry as mediators of the relationship between self-compassion and depression and anxiety. *Personality and Individual Differences, 48*(6), 757–761. doi:10.1016/j.paid.2010.01.023

Raes, F., Daems, K., Feldman, G., Johnson, S., & Van Gucht, D. (2010). A psychometric evaluation of the Dutch version of the responses to positive affect questionnaire. *Psychologica Belgica, 49*(4), 293. doi:10.5334/pb-49-4-293

Raes, F., Smets, J., Nelis, S., & Schoofs, H. (2012). Dampening of positive affect prospectively predicts depressive symptoms in non-clinical samples. *Cognition & Emotion, 26*(1), 75–82. doi:10.1080/02699931.2011.555474

Rottenberg, J., Kasch, K. L., Gross, J. J., & Gotlib, I. H. (2002). Sadness and amusement reactivity differentially predict concurrent and prospective functioning in major depressive disorder. *Emotion, 2*(2), 135–146. doi:10.1037/1528-3542.2.2.135

Sierra, P., Livianos, L., & Rojo, L. (2005). Quality of life for patients with bipolar disorder: relationship with clinical and demographic variables. *Bipolar Disorders, 7*(2), 159–165. doi:10.1111/j.1399-5618.2005.00186.x

Spinhoven, P., Ormel, J., Sloekers, P., Kempen, G., Speckens, A., & VanHemert, A. (1997). A validation study of the Hospital Anxiety and Depression Scale (HADS) in different groups of Dutch subjects. *Psychological Medicine, 27*(2), 363–370.

Schotanus-Dijkstra, M., Pieterse, M. E., Drossaert, C. H., Westerhof, G. J., DeGraaf, R., Ten Have, M., ... Bohlmeijer, E. T. (2016). What factors are associated with flourishing?

Results from a large representative national sample. *Journal of Happiness Studies, 17*(4), 1351–1370. https://doi.org/10.1007/s10902-015-9647-3

Slade, M. (2010). Mental illness and well-being: the central importance of positive psychology and recovery approaches. *BMC Health Services Research, 10*(1). doi:10.1186/1472-6963-10-26

Trompetter, H. R., deKleine, E., & Bohlmeijer, E. T. (2017). Why does positive mental health buffer against psychopathology? An exploratory study on self-compassion as a resilience mechanism and adaptive emotion regulation strategy. *Cognitive Therapy and Research, 41*(3), 459–468. https://doi.org/10.1007/s10608-016-9774-0

Vojta, C., Kinosian, B., Glick, H., Altshuler, L., & Bauer, M. S. (2001). Self-reported quality of life across mood states in bipolar disorder. *Comprehensive Psychiatry, 42*(3), 190–195. doi:10.1053/comp.2001.23143

Westerhof, G. J., & Keyes, C. L. M. (2009). Mental Illness and Mental Health: The Two Continua Model Across the Lifespan. *Journal of Adult Development, 17*(2), 110–119. doi:10.1007/s10804-009-9082-y

Wolkenstein, L., Zwick, J. C., Hautzinger, M., & Joormann, J. (2014). Cognitive emotion regulation in euthymic bipolar disorder. *Journal of Affective Disorders, 160*, 92–97. doi:10.1016/j.jad.2013.12.022

Wood, A. M., & Joseph, S. (2010). The absence of positive psychological (eudemonic) well-being as a risk factor for depression: A ten year cohort study. *Journal of Affective Disorders, 122*(3), 213–217. doi:10.1016/j.jad.2009.06.032

Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta psychiatrica scandinavica, 67*(6), 361-370.