



Brief report

Extreme positive and negative appraisals of activated states interact to discriminate bipolar disorder from unipolar depression and non-clinical controls

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ABSTRACT

Background: This research aimed to test whether positive, negative, or conflicting appraisals about activated mood states (e.g., energetic and high states) predicted bipolar disorder.

Methods: A sample of individuals from clinical and control groups (171 with bipolar disorder, 42 with unipolar depression, and 64 controls) completed a measure of appraisals of internal states.

Results: High negative appraisals related to a higher likelihood of bipolar disorder irrespective of positive appraisals. High positive appraisals related to a higher likelihood of bipolar disorder only when negative appraisals were also high. Individuals were most likely to have bipolar disorder, as opposed to unipolar depression or no diagnosis, when they endorsed both extremely positive and extremely negative appraisals of the same, activated states.

Limitations: Appraisals of internal states were based on self-report.

Conclusions: The results indicate that individuals with bipolar disorder tend to appraise activated, energetic internal states in opposing or conflicting ways, interpreting these states as *both* extremely positive and extremely negative. This may lead to contradictory attempts to regulate these states, which may in turn contribute to mood swing symptoms. Psychological therapy for mood swings and bipolar disorder should address extreme and conflicting appraisals of mood states.

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Ascertaining the exact nature of the psychological processes underlying bipolar symptomatology is a clear priority, as for effective psychotherapeutic interventions to be developed, the targets for change must be properly specified. To this end, there has been a surge in research attempting to identify these psychological processes, particularly focusing on cognitions (Mansell and Pedley, 2008). Cognitions represent crucial targets for therapy because they can be targeted outside of manic episodes and because they can cause vulnerability to further episodes (Lam et al., 1999).

Cognitions about mood states may be particularly relevant in causing and maintaining mood symptoms in bipolar disorder (BD) (Mansell et al., 2007). The extensive research on these cognitions in BD has tended to focus on either positive biases in cognition or negative biases in cognition. A recent cognitive model of mood swings suggests that positive and negative biases in cognitions about mood states are relevant in BD. Individuals can appraise the same mood states in multiple, positive and negative ways, and it is argued that the extent to which these multiple appraisals are in opposition with one another determines mood swing symptoms (Mansell et al., 2007).

It is proposed that the presence of opposing or contradictory appraisals about mood states may drive mood fluctuations and also prevent change, as despite their negative beliefs about

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extremely activated states, individuals do not want to give up these experiences. Research is yet to explore this possibility. This article reports on the first empirical study to explore whether the presence of multiple, opposing appraisals of the same states might discriminate individuals with bipolar disorder from individuals with unipolar depression and controls.

Previous research into BD and hypomania has focused on a number of positive biases in cognitions about mood states including highly positive self beliefs (Lam et al., 2004) and positive attributions of hypomania-relevant experiences (Alatiq et al., 2010; Jones et al., 2006; Mansell et al., 2011). For example, individuals vulnerable to bipolar episodes may believe that when they feel full of energy, they are extremely funny and witty, or may believe they can only achieve important goals when they are feeling high.

A range of negative biases in cognitions have been associated with hypomania and BD, including low self esteem (Blairy et al., 2004), self-criticism (Rosenfarb et al., 1998), dysfunctional attitudes (Scott et al., 2000), and a negative attributional style (Bentall et al., 2005). Catastrophic appraisals of different mood states have also been implicated (Alatiq et al., 2010; Mansell et al., 2011). For example, vulnerable individuals may believe that when they get very excited they will lose control of their thoughts or feel that they should be ashamed of themselves for getting agitated.

Consistent with the above summary, a review of the literature on the psychological processes associated with manic symptoms concluded that both positive and negative biases in cognition are involved (Mansell and Pedley, 2008). However, no studies have tested whether positive and negative biases interact to predict bipolar disorder. In the context of positive and negative biases in cognitions about mood states, this is particularly relevant, as opposing beliefs or appraisals about the same internal states may influence mood swings (Mansell et al., 2007). The model suggests that these appraisals influence emotion-regulation attempts, as the extreme ways that individuals appraise mood states trigger efforts to exert control, in order to avoid negative consequences, attain success, or seek safety (Mansell et al., 2007). For example, an individual may appraise their thoughts racing (a high activation state) as both a sign of their great intelligence and as a sign of losing control of their mind. The way individuals appraise internal states might influence the way they strive to regulate these states. For example, they may swing between struggling to speed up their thinking (e.g., by taking stimulants) and trying to slow down or stop their thoughts (e.g., by social withdrawal). This process may underlie mood swing symptoms.

Feldman et al. (2007) found that individuals vulnerable to mania tended to engage in opposing or conflicting attempts to regulate the same moods, for example, dampening alongside positive rumination. However, research has not yet explored whether the presence of opposing appraisals of the same mood states, which may drive opposing emotion-regulation attempts, characterises bipolar disorder. This study is the first to empirically test the premise that opposing appraisals of the same mood states predict bipolar disorder, by examining whether positive and negative appraisals interact such that the presence of both extremely positive and extremely negative appraisals of the same states predicts bipolar disorder. The Hypomanic Attitudes and Positive Predictions Inventory

(HAPPI) was used to assess appraisals, as it has been found to prospectively predict symptoms in a clinical sample (Dodd et al., 2011). This study focused on high-activation states such as feeling energetic. Whilst these states are commonly experienced, extreme appraisals of these states may lead these states to become dysregulated in BD (Mansell et al., 2007). It was hypothesised that individuals who do not appraise these activated mood states in extreme ways would be unlikely to experience problematic mood symptoms, and individuals who appraise mood states either extremely positively or extremely negatively might experience extreme symptoms of one type of mood, such as depression. Thus, it was hypothesised that the interaction between positive appraisals and negative appraisals of the same mood states would differentiate individuals with bipolar disorder from individuals with unipolar depression and controls.

1. Method

1.1. Participants and procedure

A sample of 279 individuals with a diagnosis of bipolar disorder I or II ($n = 171$), unipolar depression ($n = 42$), or no diagnosis ($n = 64$) participated in this study and completed the Hypomanic Attitudes and Positive Predictions Inventory (HAPPI-50).¹ Participants were recruited through clinical practice, from the community, and through the Manic Depression Foundation (MDF). Participants' diagnosis was established using either the Structured Clinical Interview for the Diagnostic and Statistical Manual (SCID) or the Mini-International Neuropsychiatric Inventory (MINI). The research was approved by the University of Manchester Research Ethics Committee, and all participants gave informed consent.

1.2. Materials

The *Hypomanic Attitudes and Positive Predictions Inventory (HAPPI-50; Mansell, 2006)*: a 50-item questionnaire which assesses positive and negative beliefs about internal states, e.g., "When I feel agitated and restless it means that I am about to have a breakdown". The scale was developed in the context of the cognitive model of bipolar disorder (Mansell et al., 2007). Items are rated on a 10 cm visual analogue scale with 1 mm intervals marked from 0% (don't believe this at all) to 100% (believe this completely). Participants marked the line using a pencil, and responses were measured by the researcher and coded such that, for example, a mark at the 50 mm point represented a score of 50% for that item.

The *SCID assessment for DSM-IV-TR diagnosis (SCID-I; First et al., 2002)*: a structured interview to establish a patient's diagnosis. Interviewers were trained using the training videos, interview observations, and reflective role-play. Feedback was given to ensure all interviewers achieved appropriate proficiency levels. There was 100% inter-rater agreement between the interviewers and an experienced clinical psychologist on the groupings of participants.

¹ Participants were involved in wider studies into clinical functioning, and completed this measure in the context of other self-report items. Other analyses using subsections of this sample are reported elsewhere (Alatiq et al., 2010; Dodd et al., 2011; Mansell, 2006; Mansell et al., 2011).

The MINI (Sheehan et al., 1998): an abbreviated psychiatric structured interview that assesses the major adult Axis I disorders in the DSM-IV. The MINI has previously been found to have good concordance with the SCID assessment, producing the same diagnosis in 85–95% of cases (Sheehan et al., 1998).²

1.3. Analysis

Three raters independently categorised items on the HAPPI-50 as positive appraisals about activated mood states, negative appraisals about activated mood states, or neither, as the present research aimed to specifically compare positive and negative beliefs about the same mood states. A number of the HAPPI items refer to appraisals of other mood states, so these were classified as ‘neither’. The agreement between the raters who categorised the HAPPI items was significant and high, $k_{gen} = 0.79$, $SE_{Fleiss} = 0.07$, $p < 0.001$, $CI_{lower} = 0.65$, $CI_{upper} = 0.92$. However, in order to be as conservative as possible, only items which all three raters agreed upon were included in the analyses. This resulted in 13 positive appraisal items and 7 negative appraisal items (Table 1). The positive appraisals and negative appraisals factors were summed. The distribution of the positive and negative appraisals factors differed significantly from the normal distribution (positive: $KS = .072$, $p < .001$, negative: $KS = .11$, $p < .0001$). The data were positively skewed, so the \log_{10} transformation was applied. Stem and leaf plots identified two outliers for the positive appraisals factor which were removed from the analyses. The summed scores on each subset of HAPPI items were standardised, and the interaction term was calculated by multiplying the two standardised sums together. The groups were coded for comparison using dummy coding; for each comparison the bipolar group was coded as 1 and the comparison group as 0.

2. Results

2.1. Descriptive statistics

The average age of bipolar I participants was 47.72 ($s.d.$ = 11.27, 66% female), of bipolar II participants was 40.18 ($s.d.$ = 12.53, 66% female), of unipolar depressed participants was 36.52 ($s.d.$ = 13.28, 69% female) and of controls was 36.23 ($s.d.$ = 15.01, 63% female). As participants in the bipolar groups, most notably the bipolar I group, were older on average, age was included as a covariate in all analyses.

2.2. Reliability

Internal consistency was $\alpha = .89$ for the positive appraisals items, and $\alpha = .87$ for the negative items.

2.3. Regression analyses

Logistic regressions were performed for three comparisons: bipolar vs. control (model 1), bipolar vs. unipolar (model 2) and bipolar 1 vs. bipolar 2 (model 3). The predictors were

Table 1

Final positive and negative appraisal items.

HAPPI-50 item	Final list
1. When I feel good, I am sure that everything will work out perfectly.	Positive appraisals
2. When I get excited about something I have no control over my thoughts.	Negative appraisals
3. When I feel excited, my fears and worries are no longer real.	Positive appraisals
5. When my energy levels increase, I can bring about a large rise in my social status.	Positive appraisals
6. When I feel agitated and restless it means that I am about to have a breakdown.	Negative appraisals
9. When I feel full of energy I am extremely funny and witty.	Positive appraisals
11. When I get very agitated about something, I have no control over my behaviour.	Negative appraisals
14. I have all my best ideas when I feel extremely good about myself.	Positive appraisals
19. When I have a lot of energy, I don't need support from anyone or anything.	Positive appraisals
26. When I feel restless, the world becomes full of unlimited opportunities for me.	Positive appraisals
27. Unless I am active all the time, I will end up a failure.	Positive appraisals
30. The better I feel about myself, the worse other people react towards me.	Negative appraisals
32. When I feel more active I realise that I am a very important person.	Positive appraisals
33. When I feel good about myself, I realise that all my previous anxieties and fears are unfounded.	Positive appraisals
37. When I feel really good, people don't understand me.	Negative appraisals
39. When I feel excited I know that other people desire me.	Positive appraisals
40. When I feel good, I know that whatever I do, I could do no wrong.	Positive appraisals
41. Doing anything very active can lead me to have a breakdown.	Negative appraisals
44. When I am more active than usual, other people dislike me.	Negative appraisals
48. When I feel good, I must keep "on the go" all the time or things will fall apart around me.	Positive appraisals

entered in three steps: age was entered in step 1 as a potential covariate, the ‘positive appraisals’ and ‘negative appraisals’ factors were entered in step 2, and the interaction term was entered in step 3.

2.3.1. Model 1

The hierarchical logistic regression model significantly differentiated individuals with bipolar disorder from controls. Age was a significant positive predictor and the negative appraisals factor was a significant positive predictor. The positive appraisals factor was not significant. The interaction between positive and negative appraisals was a significant positive predictor (Table 2). Fig. 1 depicts the interaction effect. The highest likelihood of bipolar disorder resulted when individuals had high positive and high negative appraisals, whilst the lowest probability resulted where there were low negative appraisals and high positive appraisals.

2.3.2. Model 2

The hierarchical logistic regression model significantly differentiated individuals with bipolar disorder from individuals with unipolar depression. Age was a significant positive

² The majority of the participants had participated in studies utilising the SCID-I assessment, but 60 of the participants were instead assessed using the MINI.

Table 2
Results of hierarchical binary logistic regression analyses.

Model	Step	Predictor	<i>b</i>	<i>p</i>	<i>Exp(B)</i>	95% <i>CI</i>	χ^2 (<i>df</i>)	χ^2 change
1	1	Age	.79	.00	2.20	1.55–3.12	22.09 (1)	
1	2	Age	1.08	.00	2.95	1.10–2.81		
1	2	Positive	–.17	.57	.85	.47–1.51		
1	2	Negative	1.98	.00	7.27	3.60–14.68	101.32 (3)	79.23 p = .00
1	3	Age	1.21	.00	3.34	2.03–5.50		
1	3	Positive	.37	.26	1.44	.76–2.74		
1	3	Negative	2.58	.00	13.21	5.52–31.65		
1	3	Interaction	.95	.00	2.58	1.58–4.24	118.95 (4)	17.63 p = .00
2	1	Age	.87	.00	2.39	1.51–3.78	15.46 (1)	
2	2	Age	1.02	.00	2.77	1.60–4.79		
2	2	Positive	–.70	.07	.59	.24–1.05		
2	2	Negative	1.89	.00	6.59	2.87–15.13	47.64 (3)	32.18 p = .00
2	3	Age	1.17	.00	3.25	1.77–5.88		
2	3	Positive	–.25	.50	.78	.39–1.59		
2	3	Negative	2.08	.00	8.04	3.38–19.13		
2	3	Interaction	1.11	.02	3.04	1.21–7.61	60.13 (4)	12.49 p = .01
3	1	Age	.59	.01	1.80	1.15–2.84	6.77 (1)	
3	2	Age	.56	.02	1.76	1.10–2.81		
3	2	Positive	–.20	.55	.82	.43–1.57		
3	2	Negative	.19	.62	1.21	.58–2.51	7.15 (3)	.04
3	3	Age	.54	.03	1.72	1.07–2.77		
3	3	Positive	–.23	.51	.80	.41–1.57		
3	3	Negative	.15	.70	1.16	.54–2.49		
3	3	Interaction	–.16	.37	.85	.60–1.21	7.92 (4)	.08

Note. Significant predictors and differences are in bold.

predictor and the negative appraisals factor was a significant positive predictor. The positive appraisals factor was not significant. The interaction was significant (Table 2). Fig. 2 depicts the interaction effect. The highest likelihood of bipolar disorder was for individuals with high negative and high positive appraisals. The probability of bipolar disorder was lowest when negative appraisals were low and positive appraisals were high.

2.3.3. Model 3

There was a main effect of age (Table 2), however this effect was not thought to be substantive and instead was thought to be a reflection of the differing ages in the two samples.

3. Discussion

The results provide the first empirical evidence that positive and negative cognitions interact to predict bipolar disorder. Individuals with bipolar disorder tended to have high levels of

both positive and negative appraisals about the same states. Inspecting the interaction between positive and negative cognitions about mood states in bipolar disorder reveals that whilst high levels of positive appraisals predict an increased probability of bipolar disorder at high levels of negative appraisals; when negative appraisals are low, positive appraisals appear to relate to a lower likelihood of bipolar disorder. Thus, positive appraisals about activated states only appear to predict bipolar disorder in combination with high levels of negative appraisals.

This pattern of the relationship between positive appraisals about activated states and bipolar vulnerability is in contrast to the literature (e.g., Jones and Day, 2008; Jones et al., 2006) which proposes that positive self-appraisals of activated internal states, and not negative appraisals, are the most important predictor of bipolar vulnerability. Previous studies of positive appraisals in bipolar disorder and hypomania have not tested and controlled for negative appraisals. The apparent effect of positive appraisals observed in previous studies may have

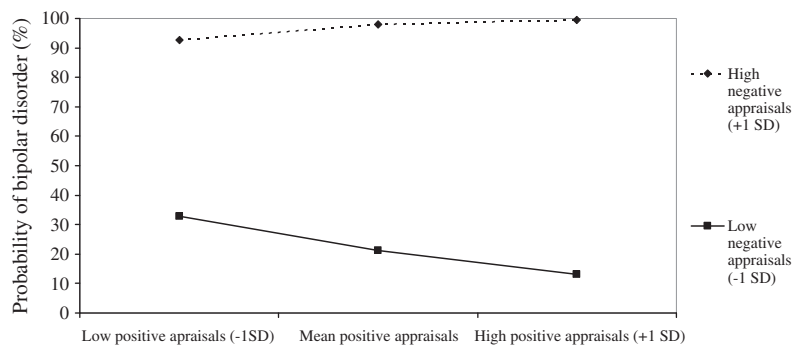


Fig. 1. Interaction between positive and negative appraisals predicts likelihood of bipolar disorder when comparing individuals with bipolar disorder to controls.

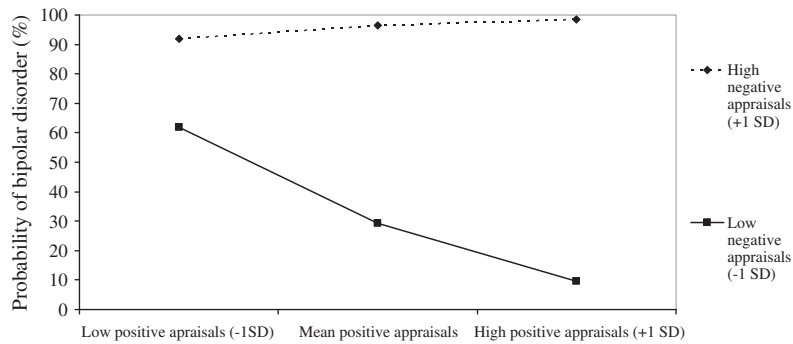


Fig. 2. Interaction between positive and negative appraisals predicts likelihood of bipolar disorder when comparing individuals with bipolar disorder to individuals with unipolar depression.

occurred simply because positive and negative appraisals are correlated (Mansell, 2006; Mansell et al., 2008). However, this provides a misleading picture, as the appraisals interact to predict bipolar disorder (statistically: main effects cannot be interpreted in the presence of an interaction), and the effects of positive appraisals are very different when negative appraisals are also considered. The data demonstrate that the interactive effect of positive and negative cognitions predicts disorder and thus support the argument that positive and negative aspects of functioning should not be considered individually (e.g., Wood and Tarrier, 2010).

The results of this study are in line with the integrative–cognitive model of bipolar disorder (Mansell et al., 2007). The model suggests that opposing extreme positive and negative beliefs about the same mood states might lead to conflict. For example, an individual might appraise feeling energetic as positive, because they believe they are more productive at work when in this state, but also appraise it as negative at the same time because they fear they may lose control when in this state. Thus, they may feel conflicted about whether to avoid or suppress this state or to strive to attain it. It is suggested that this type of conflict might be important in determining the mood fluctuations observed in bipolar disorder, as individuals oscillate from controlling their moods in one way and then the next. Although prospective research indicates that cognitions about mood do causally influence mood symptoms, further research is needed to establish the relationship between appraisals and emotion-regulation efforts. Nevertheless, there is evidence that individuals with bipolar disorder engage in opposing attempts to regulate the same emotions (Feldman et al., 2007), which offers support for the suggestion that this mechanism may underlie mood swing symptoms.

The results of this study have clinical applications; clients' beliefs and appraisals of moods and internal states, and conflict between opposing beliefs, should be explored therapeutically, as these may drive extreme emotion-regulation attempts which manifest as mood swings. A cognitive–behavioural approach to formulation and treatment based on these premises has been described (Mansell, 2007). Treatment strategies include monitoring mood swings, formulating events triggering mood change, and using the HAPPI to identify conflicting appraisals.

It must be noted that data were not available to enable analyses to be conducted whilst controlling for current

symptoms of mania or depression. However, the HAPPI has been found to discriminate different clinical and non-clinical groups when controlling for current symptoms along with demographic variables (Mansell et al., 2011) and to prospectively predict symptoms (Dodd et al., 2011), so there is evidence that the appraisals assessed by the HAPPI are predictive of symptoms and not a consequence of symptoms. Nevertheless, this is a limitation of this study that should be addressed in future research.

In conclusion, the present research provides the first empirical evidence for the presence of extreme, opposing or conflicting beliefs about the same internal states in bipolar disorder. This paper offers support for the integrative cognitive model of bipolar disorder (Mansell et al., 2007), and suggests that further research in this area, including establishing the utility of the therapeutic approach based on the model (Mansell, 2007) is warranted.

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Conflict of interest

The authors have no conflict of interest to declare.

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