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Proneness to Decreased Negative Emotions in Major Depressive Disorder when Blaming Others rather than Oneself

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Key Words
Moral emotions · Attributional style · Self-esteem · Major depression · Vulnerability · Self-blame · Overgeneralization · Cognition

Abstract
Background: One widespread view holds that vulnerability to major depressive disorder (MDD) is linked to overall increases in negative emotionality. In contrast, cognitive attribution theories emphasize the importance of blaming oneself rather than others for negative events. Thus far, the contrasting predictions of these models have not been directly compared. Following the attributional perspective, we tested the hypothesis that people with remitted MDD show no overall bias towards negative emotions, but a selective bias towards self-blaming emotions relative to those emotions associated with blaming others. ***Sampling and Methods:*** We compared a remitted MDD and a control group on a novel experimental test that allowed us to directly compare proneness to specific emotions associated with different types of self-blame (guilt, shame, self-contempt/disgust) and blame of others (other-indignation/anger, other-contempt/disgust) whilst controlling for negative valence and medication status, and excluding comorbidity. ***Results:*** In agreement with our hypothesis, individuals with remitted MDD exhibited an increased self-contempt bias (difference between contempt/disgust towards self and others) but no increased proneness to any other negative emotion or overall increases in perceived negative valence of stimuli. Moreover, the remitted MDD group exhibited reduced contempt/disgust towards others. ***Conclusions:*** Our results corroborate the prediction that vulnerability to MDD is associated with an imbalance of specific self- and other-blaming emotions rather than a general increase in negative emotions. Based on the composition of our sample, we speculate that self-contempt bias may be particularly characteristic of melancholic MDD subtypes and could be useful for stratification of depression in the future.

Introduction

Excessive guilt and self-blame are frequently reported by people with major depressive episodes across cultures [1]. Most consistently, self-blame manifests itself as the experience of worthlessness [2] in symptomatic major de-

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pressive disorder (MDD) [1, 3] and reduced self-esteem after remission [4–8]. One hypothesis is that vulnerability to MDD is linked to proneness to experience negative emotions in general (i.e. 'negative affectivity' [9]) without specifying whether this includes self-blaming emotions (guilt, shame, self-contempt/disgust) or those related to blaming others (indignation/anger, contempt/disgust towards others). A largely separate literature on cognitive attributions has proposed that increased MDD vulnerability arises from the tendency to make internal rather than external attributions of causal agency for negative events. Self-blaming attributions are closely linked with self-blaming emotions [10]; thus, from attributional models one would predict a relative abundance of self-blaming emotions in MDD with relatively lowered negative emotions related to blaming others. Finding such selective effects on some negative emotions but not others would challenge currently widespread views of MDD as a disorder of being unable to downregulate negative emotions in general (reviewed in [11]) and thereby has important implications for the pathophysiology of MDD vulnerability.

Janoff-Bulman [12] proposed two distinct types of self-blame, behavioural and characterological self-blame, which were associated with different attributions and self-blaming emotions [13, 14]. Behavioural self-blame was defined as involving internal and unstable attributions of negative events to one's own controllable behaviour [12] and was associated with feelings of guilt [12, 14–16], whereas characterological self-blame was defined as blaming oneself for things that one has no control over, such as relatively enduring character traits [12]. The latter thereby entails a global (overgeneral) form of self-blame and such maladaptive devaluation of the 'whole' self was hypothesized to be associated with feelings of shame [13–17]. In contrast, work by O'Connor and colleagues provides evidence against the general association of guilt-proneness with behavioural self-blame by identifying characterological forms of empathy-based guilt [18–21]. Similarly, self-contempt/disgust is likely to be linked with characterological self-blame. It has been proposed that MDD vulnerability is due to internal characterological attributions (e.g. 'I did not do well in the exam → I always fail exams → I am a total failure' [2, 12, 22]) rather than attributions to one's specific controllable behaviour (e.g. 'I did not study hard enough').

From the foregoing it might be predicted that self-blaming emotions entailing characterological (shame, self-contempt/disgust) rather than those that entail behavioural self-blame (guilt) would be associated with depressive symptoms. Indeed, shame- rather than guilt-proneness has been associated with severity of depressive symptoms in healthy populations with no history of MDD [17, 23]. In people with MDD, however, elevations in both shame- and guilt-proneness have been reported using different questionnaires [21, 24–26]. Increased shame-proneness has been demonstrated in currently symptomatic [21, 24–27] and remitted MDD [25, 27]. However, in addition, scores on measures of guilt-proneness were found to be increased in symptomatic [21, 24, 25] and remitted MDD [25], and guilt- but not shame-proneness was correlated with the severity of depressive symptoms [28] in symptomatic MDD. In summary, there is contradictory evidence on the relative importance of shame and guilt in MDD. This is probably partly due to the inconsistent definitions of shame and guilt, and how they were measured.

Scores on the Interpersonal Guilt Questionnaire (IGQ-67 [18]) which captures characterological forms of empathy-based guilt are elevated in symptomatic MDD [21]. Although this may be maladaptive for the individual with regard to group competition, altruistic individuals with high empathy-based guilt may have provided survival advantages in the competition between groups in our evolutionary history [19, 29, 30]. Empathy-based guilt and self-hate as measured on the IGQ-67 were associated with depressive symptoms and this association remained even when controlling for levels of shame [20].

A deeper understanding of the role of different self-blaming feelings in the psychopathology of MDD requires the consideration of their distinctive qualities and social functions. Shame has been shown to involve feeling that one has been lowered in the esteem of others [31], is related to social comparison and competition [26], and its characterological nature is thought to make it particularly maladaptive. In contrast, guilt has been linked with failing to live up to internalized moral duties [31], and interestingly, increased dutifulness and a sense of responsibility are prominent personality traits in people with melancholic depression [32] as is inappropriate guilt (DSM-IV-TR, American Psychiatric Association [33]). By focussing on these two self-blaming emotions, other types of self-blaming feelings have gone largely unexplored. We hypothesized that self-contempt/disgust is of particular relevance to MDD because it entails the devaluation of one's character [34] like shame, but is related to violations of internalized moral duties [31] like guilt. So far, only self-hate [21], a construct closely related to self-contempt/disgust, has been investigated in MDD. Self-hate was found to be associated with overgeneralized

forms of guilt such as omnipotent responsibility and survivor guilt [21]. Studies into self-contempt/disgust have been restricted to observer-rated measures [35] and questionnaire-assessed self-disgust in healthy populations that were associated with higher scores on questionnaires measuring depressive symptoms [36, 37], but have not yet been carried out in individuals with MDD.

Rather than comparing negative emotions related to self-blame and blaming others directly in MDD, previous studies have solely investigated self-blaming feelings. An increase in self-blaming feelings itself, however, would be compatible with the hypothesis of an overall increase in negative emotions. Only by showing a relative reduction in negative emotions related to blaming others in MDD could one rule out a general increase in negative emotions. Furthermore, proneness to self-blaming emotions has mostly used questionnaire measures aimed at the underlying emotions as hidden constructs by asking for the hypothesized behavioural consequence of the emotion (e.g. hiding/withdrawal for shame and reparative action for guilt) rather than probing participants' subjective intuitions about these emotions which clinical descriptions rely on. This was based on the assumption that people are not able to distinguish emotions such as shame, guilt, or self-contempt/disgust well [16]. Recent work on the neural basis of moral emotions [38], however, has shown that participants exhibit distinctive neural signatures to be associated with stimuli subjectively reported as evocative of a particular moral emotion [39, 40]. This is in keeping with anthropological evidence of transcultural ubiquity of distinct moral emotions [41] that must rely on transculturally stable conceptual underpinnings [42].

Here, we used an adaptation of an experimental task originally developed for functional MRI [39], the value-related moral sentiment task (VMST), to measure proneness to experience experimentally induced self- and other-blaming moral emotions. We compared control individuals with no personal or family psychiatric history to individuals with remitted MDD, thereby revealing vulnerability traits rather than correlates of depressive states [43]. People with remitted MDD reliably show increases on measures of overall negative emotionality [44] and show a largely increased risk of developing future major depressive episodes compared with people with no personal history of MDD [45]. The stimuli for the VMST are based on previous normative studies [39, 46]. The VMST allowed us to directly compare self- (guilt, shame, self-contempt/disgust) and other-blaming emotions (indignation/anger towards others, contempt/disgust towards others).

This test allowed us to control the degree of negative emotions by obtaining additional ratings of negative valence of stimuli during the task. We tested the hypotheses that (1) individuals with remitted MDD show a relative bias towards self-blaming relative to other-blaming (self-blaming emotional bias) rather than an overall increase in negative emotions, (2) that this self-blaming emotional bias occurs selectively for contempt/disgust rather than guilt or shame, and (3) that self-contempt bias is associated with lower self-esteem. The prediction of normal levels of guilt on the VMST in people with remitted MDD was based on the assumption that guilt as measured on the VMST captures non-depressiogenic forms of self-blame rather than those more overgeneral forms as captured on the IGQ and on the VMST self-contempt bias score which we expected to be associated with MDD.

Methods

Participants

This study was approved by the South Manchester NHS Research Ethics Committee. All of the participants (n = 55) gave written informed consent and were compensated for time and travel costs. Twenty-seven participants with remitted MDD and 28 control participants with no history of or first-degree relatives with MDD were enrolled. The groups were matched on age [control group mean = 22.7 ± 3.5 (± refers to standard deviations throughout the text), remitted MDD mean = 25.6 ± 7.5, t = –1.8, p = 0.07], education (control group mean = 15.8 ± 1.6, remitted MDD mean = 16.1 ± 2.1, t = –0.6, p = 0.52), and gender (control group: 21 female, 7 male, remitted MDD: 22 female, 5 male, contingency coefficient = 0.08, p = 0.56). Matching was achieved by parallelizing the groups on these demographic variables.

Participants were recruited using online and print advertisements inviting individuals with a history of depression and healthy individuals with no psychiatric history to participate. Initial suitability was assessed with a phone pre-screening interview in 171 volunteers (for exclusion reasons see table 1) which included questions about personal history of major physical illnesses, substance abuse, axis-I disorders, psychological and pharmacological treatment, and family history of psychiatric disorders (a copy of the screening interview can be obtained from the authors upon request). Inclusion criteria for both groups were right-handedness, English as first language, and aged 18–65 years. Additional inclusion criteria for the history of depression group was at least one past MD episode according to *Diagnostic Statistical Manual* (DSM-IV-TR, American Psychiatric Association) that was a moderate-to-severe depressive episode according to the International Classification of Diseases (ICD-10, World Health Organization) with a duration of at least 2 months requiring treatment and remission of symptoms for at least 12 months.

Exclusion criteria for both groups were residual symptoms of or manifest axis-I disorders [47], significant psychosocial impairment as an indicator of a clinically relevant personality disorder or incomplete remission, a Montgomery Åsberg Depression Rat-

Table 1. Exclusion reasons for volunteers following phone pre-screening interview

Reason for exclusion	n
Control and Remitted MDD groups	
Substance or alcohol abuse	9
MRI contraindications	5
Other psychiatric disorders than MDD	18
Severe developmental disorders	1
General medical condition	7
Family history of MDD/bipolar/schizophrenia (control) or bipolar/schizophrenia (MDD)	9
Current antidepressant (control) or other centrally active medications (MDD)	3
Left-handed	2
Non-native English speaker	9
Remitted MDD group only	
Not meeting full screening criteria for MDE	5
Not remitted for 12 months	16
Fulfilling criteria for current MDE	8
Total excluded after phone pre-screening	92

In total, 171 people participated in the phone pre-screening interview, 79 passed this screening with 36 in the remitted MDD and 43 in the control group and were invited for the first study day. Of these, 33 individuals pre-screened as remitted MDD and 30 pre-screened as control participants were reachable, able, and willing to be seen on the first study day after reading the participant information sheet sent to them. After the first day of the study, 5 of 33 individuals from the remitted MDD group were excluded (1 fulfilled criteria for current MDD, 2 showed residual symptoms of post-traumatic stress disorder, 1 had a relapse and developed an MD episode after the first study day before being scheduled for the second session); the remaining 28 participants confirmed as remitted MDD completed the second session. One participant from the remitted MDD group was excluded because of selecting more than one moral emotion in more than 5% of trials resulting in 27 participants in the final remitted MDD group. All 30 participants seen on the first study day who had fulfilled phone pre-screening criteria for the healthy control group were confirmed as fulfilling inclusion and exclusion criteria on clinical assessments and were invited for the second session; however, 1 participant was not reachable following the first study session. Data from 1 control participant was excluded because of selection of more than one feeling on more than 5% of trials resulting in a total of 28 participants in the healthy control group.

ing Scale (MADRS [48]) score >10 (= cutoff for depression [49]), current self-harming behaviour, a history of alcohol or substance abuse, schizophrenia, schizo-affective disorder, bipolar disorder, developmental disorders, learning disabilities, or neurological illnesses or physical illnesses that significantly impair psychosocial functioning or brain function. Additional exclusion criteria for the remitted MDD group were centrally active medication other than antidepressants and hormonal contraceptives, or depressive episodes secondary to another psychiatric disorder. Additional exclusion criteria for the healthy control group were centrally active medication other than hormonal contraceptives; a history of medication with antidepressants, antipsychotics, or tranquilizers; or a first-degree relative with a diagnosed major depression, bipolar disorder or schizophrenia, or a history of any axis-I disorder [47] with a corresponding category in ICD-10.

Suitable participants according to the phone pre-screening (table 1) were invited for a clinical interview by a senior psychiatrist (R.Z.) in which psychiatric, medical, and family history were assessed and a neurological exam was carried out while assuring strict confidentiality. The following instruments were administered after the clinical assessment by S.G. with R.Z. being present to assure diagnostic reliability: the Structured Clinical Interview for DSM-IV (SCID-I [50]) Mood Disorders Module A (both R.Z. and S.G. had completed the recommended SCID-I training), which was modified to allow lifetime diagnoses of MD subtypes and was used as a standardized measure to verify diagnosis of MDD [47]; the MINI-International Neuropsychiatric Interview, which was adapted to allow assessment of lifetime psychiatric disorders [51, 52]; and a shortened version of the Weissman Family History Screen [53], which was used to assess the psychiatric history of first-degree family members.

Residual symptoms of depression were assessed using the MADRS [48] and psychosocial functioning was assessed using the Global Assessment of Functioning (GAF [50]) Scale (Axis-V, DSM-IV). Both groups had GAF scores indicating minimal or absent symptoms (>80), although control participants exhibited higher scores (control mean = 89.3 $\pm$ 4.7, remitted MDD mean = 83.3 $\pm$ 7.2, t = 3.70, p = 0.001). Both groups had MADRS scores that were well below the cutoff for depression (10 points), but the remitted MDD group showed slightly higher scores (control mean = 0.2 $\pm$ 0.6, remitted MDD mean = 1.3 $\pm$ 1.8, t = –3.00, p = 0.005). The clinical details of the remitted MDD group are summarized in table 2. All participants also took part in a separate fMRI study before completing the experimental tasks reported here.

Standard Measures

To assess global self-esteem, the Rosenberg Self-Esteem Scale [54] was administered. We rescaled the scoring of this scale from 1 to 4 instead of from 0 to 3. The IGQ-67 (O'Connor et al. [18]) previously validated in current MDD was used to assess self-hate [18, 21] which we expected to correlate with self-contempt bias and also included survivor guilt and omnipotent responsibility guilt measures previously shown to be elevated in current MDD [21]. Further, the Test of Self-Conscious Emotions (TOSCA-3) as a measure of shame- and guilt-proneness as defined by Tangney and Dearing [55] were used to validate our VMST measures, and the Attributional Style Questionnaire (ASQ [56]) was employed to assess depressiogenic attributional styles.

Experimental Assessment of Self-Blaming and Other-Blaming Feelings

In order to assess proneness to experience different experimentally induced self- and other-blaming feelings, we used the VMST, which can be obtained from the authors upon request. Participants were shown written descriptions of negative interactions between themselves and their best friends in which either themselves (self-agency condition, n = 90), or their best

friend (other-agency condition, n = 90) acted counter to social and moral values. The best friend was chosen in order to equate familiarity with the agents and recipients in each condition, but at the same time to measure interactions with a person with whom one has no kinship relationships which could directly affect the participants' evolutionary fitness. Before the experiment they had to enter the nickname of their best friend who was of the same gender and not genetically or otherwise related, nor someone with whom they had had a sexual relationship with. Statements read as '(participant's best friend's name) does act tactlessly towards you' (other-agency condition, 90 items), and 'You do act tactlessly towards (participant's best friend's name)' (self-agency condition, 90 items). The same social concepts (e.g. 'tactless', 'generous') were used in the self- and other-agency condition: 50% of the stimuli used negative concepts (e.g. 'tactless') and 50% used negated positive concepts (e.g. 'not generously'). Participants were required to select the feeling that they felt was the best label for the emotion that they would experience most strongly in response to the social violation. This instruction was given to enhance differentiation between these emotions. The choice of feelings included shame, guilt, indignation/anger towards oneself, indignation/anger towards best friend, contempt/disgust towards oneself, contempt/disgust towards best friend, no feeling, other feeling. Participants rated how strongly they would experience negative feelings as a result of the behaviour using a 1–7 visual analogue Likert scale (1 = not unpleasant, 7 = extremely unpleasant). This task is based on an earlier version and details about the stimulus selection and design have also been described in Zahn et al. [39, 46].

Data Analysis

All analyses were carried out using SPSS15 (www.spss.com). The percentages of valid items in each condition (self-agency, other-agency) for which individuals selected a specific feeling were used for analysis. Only those trials in which individuals selected self-blaming feelings in the self-agency condition and other-blaming feelings in the other-agency condition were used. This was based on our previous work showing that self-blaming feelings are mostly experienced in the self-agency and other-blaming feelings mostly in the other-agency condition [39] and that we did not expect the number of agency-incongruent responses to be high enough to provide reliable measures. This expectation was confirmed with agency-incongruent responses on the VMST only occurring on an average of 2.8% of trials per category. For completeness, we report the group comparisons on agency-incongruent trials here. Compared with the control group, people with remitted MDD showed higher agency-incongruent indignation/anger towards themselves when their best friend was the agent ($t = -2.22$, $p = 0.03$). None of the other emotions when chosen in an agency-incongruent context differed in frequency between groups ($t > -1.36$, $p > 0.18$), although there was a trend for people with remitted MDD to show more contempt towards themselves when their best friend was the agent when compared to the control group (–1.86, $p = 0.07$).

On some occasions, participants selected more than one feeling; therefore, these items were excluded from the analysis (mean = 0.71 items excluded per participant in self-agency and other-agency conditions, maximum of 5 items excluded, with no differences between groups: $t = -0.04$, $p = 0.97$). One participant was excluded from each group because they selected more than one feeling on more than 5% of trials on the VMST indicating that they did not keep to the instructions or were not able to distinguish between feelings and therefore were not able to decide which feeling they experienced most strongly.

The self-contempt bias score was calculated by subtracting the percentage of other-contempt/disgust from the percentage of self-

Table 2. Clinical characteristics of remitted MDD group (n = 28)

Past MDD subtype	
With melancholic features	16/28
With melancholic and psychotic features	1/28
With atypical features	2/28
No specific subtype	9/28
Number of previous MDEs	
1	15/28
2	8/28
3	5/28
Last MDE details	
Average length of MDE, months	15.8 ± 18.6 (range: 2–96)
Average time in remission, months	22.1 ± 16.5 (range: 12–84)
Severe MDE[1]	26/28
Moderate MDE[1]	2/28
Antidepressant medication at time of study	
SSRI antidepressant	8/28
SNRI antidepressant	1/28
Tricyclic antidepressant	2/28
None	17/28
Life-time axis-I comorbidity[2]	
Anorexia nervosa	3/28
Anorexia nervosa, binge-eating subtype	1/28
Anorexia nervosa and bulimia nervosa	1/28
Post-traumatic stress disorder	1/28
No life-time comorbidity	19/28
Family history	
First-degree relative with MDD (diagnosed)	17/28
First-degree relative with MDD (questionable)	4/28
Distant relative with MDD	1/28
No family member with history of MDD	6/28

MDD subtype classification was based on adapting the SCID-I for DSMIV-TR to allow lifetime assessment of subtypes. All medication-free participants had stopped medication well before the required washout phase. SSRI = Selective serotonin reuptake inhibitor; SNRI = serotonin norepinephrine reuptake inhibitor.

[1] According to ICD-10 criteria.

[2] All comorbid disorders were fully remitted at time of study and none of the comorbid disorders was a likely primary cause of the depressive episodes.

Table 3. Between-group comparisons on the VMST and reliability

VMST response	Split-half reliability coefficient	Control		Remitted MDD		Statistics	
		mean	SD	mean	SD	t value	p value
Guilt, %	0.86	28.5	11.5	29.5	11.2	–0.34	0.73
Shame, %	0.92	17.3	12.1	13.2	10.4	1.33	0.19
Indignation/anger towards self, %	0.88	9.0	6.8	8.0	9.0	0.48	0.63
Self-contempt/disgust, %	0.87	17.6	10.3	18.5	10.8	–0.32	0.75
Indignation/anger towards others, %	0.91	33.2	16.4	30.6	11.9	0.68	0.50
Contempt/disgust towards others, %	0.93	17.4	12.3	10.9	10.3	2.12	0.04*
Self-contempt bias, %	0.83	0.2	13.8	7.5	12.5	–2.07	0.04*
NEGVAL, s-ag	0.98	3.9	0.9	3.6	0.6	1.42	0.16
NEGVAL, o-ag	0.97	3.9	0.9	3.4	0.6	2.37	0.02*
NEGVAL self-contempt/disgust trials	–	4.9	1.2	4.7	1.1	0.59	0.56
NEGVAL contempt/disgust towards others trials	–	4.8	1.1	4.4	1.3	1.09	0.28

Self-contempt bias score = % self-contempt/disgust responses in self-agency (s-ag) condition minus % contempt/disgust towards others in other-agency (o-ag) condition. Participants rated negative emotional valence (NEGVAL) for each item using a 1–7 visual analogue Likert scale (1 = not unpleasant, 7 = extremely unpleasant). Split-half reliability was computed using the Spearman-Brown formula [69] after randomly splitting items in each condition into parallel forms based on alphabetical order of stimuli. Total sample of n = 55, degrees of freedom = 53 in all comparisons. The mean number of valid items (only one category ticked) in the s-ag conditions were (maximum n = 90): control = 89.3 ± 1.1, MDD = 89.5 ± 1.1, p = 0.51, and in the o-ag conditions: control = 89.3 ± 1.3, MDD = 89.1 ± 1.1, p = 0.60. * Significant at p = 0.05, 2-sided.

contempt/disgust responses. A direct comparison between these two measures was appropriate because their overall frequency was equal in the healthy control group indicating equal response probabilities (paired-samples t = 0.06, d.f. = 27, p = 0.95). Data were checked for outliers (outside of mean ±3 SD across the groups) and all results including outliers were confirmed by an analysis that replaced the outlying value by the nearest occurring value in the rest of the sample that was not an outlier. Statistics for 'equal variances not assumed' were reported in the case of unequal variances on two sample t tests. The significance threshold for all analyses was p = 0.05, 2-sided which allowed us to detect effect sizes of Cohen's d ≥0.8 for between-group differences with ≥83% power [57].

Results

Experimental Measure of Self- and Other-Blaming Emotions (VMST)

Split-half reliability of our experimental measures on the VMST was very good (>0.85 for each measure; table 3). There were no differences between groups in the frequency of guilt, shame, or indignation/other towards self or others (table 3). In contrast, there were significant differences for the self-contempt bias score, which was higher in the remitted MDD group (table 3) and correlated positively with self-contempt/disgust and negatively with contempt/disgust towards others (table 4). Contempt/disgust towards others was reduced in the MDD compared with the control group.

Antidepressant medication status had no influence on self-contempt bias [remitted MDD with no antidepressants (n = 17) vs. remitted MDD with antidepressants (n = 10): t = –0.01, p = 0.99].

There were no differences between groups in intensity of negative emotions in the self-agency conditions and no group differences in the negative valence of self-contempt/disgust or contempt/disgust towards others trials. However, there were group differences in negative valence in the other-agency condition which was rated as less intense by the remitted MDD group (table 3).

Between-Group Comparisons on Standard Measures

The remitted MDD group had significantly higher self-hate, survivor guilt, and omnipotent responsibility guilt scores as measured by the IGQ-67 and lower global self-esteem scores as measured by the Rosenberg scale (table 5). There were no significant group differences on the ASQ composite scores (a combination of global, internal, and stable dimensions of attributions). There were no differences on guilt-, but only on shame-scores as assessed by the TOSCA-3.

Table 4. Correlations between main VMST and standard measures

Measure	VMST-guilt	VMST-shame	VMST-self-contempt bias	VMST-self-contempt/disgust	VMST-contempt/disgust towards others
VMST-guilt	–	0.01	–0.14	–0.23	–0.04
VMST-shame	0.01	–	–0.39*	–0.03	0.42*
VMST-self-contempt bias	–0.14	–0.39*	–	0.55*	–0.67*
VMST-self-contempt/disgust	–0.23	–0.03	0.55*	–	0.25
VMST-contempt/disgust towards others	–0.04	0.42*	–0.67*	0.25	–
Rosenberg self-esteem	0.08	–0.15	–0.41*	–0.32*	0.20
TOSCA-guilt	0.30*	–0.12	0.21	0.10	–0.16
TOSCA-shame	0.10	0.02	0.37*	0.28*	–0.18
IGQ-self-hate	0.02	0.01	0.43*	0.26*	–0.26*
IGQ-survivor guilt	0.16	–0.07	0.38*	0.22	–0.25
IGQ-omnipotent responsibility guilt	0.05	–0.04	0.29^{+}	0.26*	–0.11
ASQ-composite negative attributions	0.09	0.26	0.20	0.16	–0.07
ASQ-comp. positive – negative attrib.	–0.11	–0.25	–0.32*	–0.36*	0.02

Pearson correlation coefficients are reported. * Significant at p = 0.05, two-tailed significance (n = 55, except ASQ: n = 51). For all significant correlations between VMST-self-contempt bias and standard measures that showed significant group differences, we confirmed significance by using a linear regression with VMST self-contempt bias as outcome and the standard measure as predictor, as well as group as covariate of no interest. This ensured that significant correlations between self-contempt bias and standard measures were not primarily driven by group differences. Only one significant correlation did not survive corrections for effects of group and is marked with $^{+}$.

Table 5. Between-group comparisons on standard measures

Measure	Control		Remitted MDD		Statistics	
	mean	SD	mean	SD	t value	p value
Rosenberg self-esteem	34.1	4.6	29.1	5.2	3.81	0.00*
IGQ-self-hate	23.9	5.4	36.2	11.0	–5.25	0.00*
IGQ-survivor guilt	64.8	7.6	69.9	8.2	–2.37	0.02*
IGQ-omnipotent responsibility guilt	42.8	7.2	48.8	5.9	–3.38	0.00*
TOSCA-guilt	45.1	5.7	47.0	5.0	–1.30	0.20
TOSCA-shame	29.2	7.5	34.6	10.3	–2.24	0.03*
ASQ-composite negative attribution	13.2	1.9	13.4	2.3	–0.28	0.78
ASQ-comp. positive – negative attr.	1.6	2.9	1.0	3.4	0.68	0.50

n = 1 control and n = 3 MDD participants missing for ASQ. n = 55 and degrees of freedom (d.f.) = 37.5 because of unequal variances for IGQ-self-hate. Total sample of n = 55 (d.f. = 53) in all other comparisons. * Significant at p = 0.05, 2-sided.

Validity: Association between Main VMST and Standard Measures

There was a positive correlation of self-contempt bias scores with IGQ self-hate and survivor guilt scores. In addition, there emerged a negative correlation of self-contempt bias with the Rosenberg self-esteem scores (table 4). The apparent positive correlation between self-contempt bias and omnipotent responsibility guilt was primarily driven by group differences on both measures. Although there was no association between self-contempt bias and negative attributional style, there was a negative correlation with the difference score between positive and negative attributional style on the ASQ. VMST-guilt selectively correlated with TOSCA-guilt, but not with TOSCA-shame, thereby cross-validating self-labelled guilt with adaptive guilt-constructs as-

sessed by the TOSCA. Accordingly, VMST-guilt did not correlate with measures of overgeneralized guilt on the IGQ. TOSCA-shame was associated with VMST-self-contempt bias rather than VMST-shame. This indicates that parts of the variance on the shame-construct measured on the TOSCA are associated with proneness to the subjective experience of self-contempt/disgust rather than shame. VMST-shame was not associated with any of the standard measures, but interestingly it showed a positive correlation with contempt/disgust towards others and a negative association with self-contempt bias on the VMST.

Discussion

This study compared emotional biases in two closely matched groups differing in vulnerability to MDD. We aimed to discern whether MDD vulnerability is associated with overall increases in negative emotions or a selective bias towards specific types of self-blaming emotions relative to emotions linked with blaming others. We hypothesized that people with remitted MDD exhibit a self-blaming emotional bias and that this selectively occurs for contempt/disgust, an emotion that entails judgements of one's character [34] and that is related to violations of internal moral values [31]. We corroborated both hypotheses by demonstrating selective increases in self-contempt/disgust relative to contempt/disgust towards others (self-contempt bias score) in the remitted MDD group, but no differences in proneness to feel guilt, shame, or indignation/anger towards self or others on the VMST. These results cannot be explained by an overall bias towards negative emotions since people with remitted MDD did not rate negative valence more highly than control participants. Instead, there was a decrease in negative emotions aimed towards others in the remitted MDD group. Antidepressant medication was controlled for in our analysis and cannot explain differences in self-contempt biases between the groups.

All our VMST measures showed very good reliability and their selective association with established measures were evidence of the participants' ability to distinguish meaningfully between different labels for moral emotions. Proneness to respond with guilt on the VMST was solely associated with the standard measure of guilt-proneness (TOSCA-3) that mainly assesses its hypothesized behavioural consequence, namely reparative actions. In contrast, characterological attributions and the behavioural consequences of wanting to hide as measured on the TOSCA-shame scale [16] were selectively associated with self-contempt/disgust on the VMST. Interestingly, self-labelled shame on the VMST did not correlate with its hypothesized characterological attributions and behavioural consequences as measured on TOSCA-shame [16]. This suggests that increased self-blaming tendencies assessed on the TOSCA-shame scale in previous studies could in part be due to an increased tendency to experience self-contempt/disgust rather than shame. Further supporting the validity of the VMST self-contempt bias measure was its selective correlation with the IGQ self-hate and survivor guilt scale and its association with measures of tendencies to show internal, global, and stable negative attributions (ASQ). Measures of guilt on the IGQ were previously shown to be more depressiogenic than guilt as measured on the TOSCA [20]. The selective correlation of VMST self-contempt bias with other validated measures of depressiogenic (IGQ-survivor guilt, TOSCA-shame) rather than adaptive forms of self-blame (TOSCA-guilt) supports its specificity for psychopathology. The positive association of proneness to subjectively experienced shame and contempt/disgust towards others on the VMST is in keeping with a larger body of research showing shame-proneness to be associated with negative feelings towards others [16] potentially as a protection mechanism.

In line with previous studies that used the Rosenberg Self-Esteem Scale [4–8], we found decreased self-esteem in individuals with remitted MDD which was negatively correlated with their self-contempt bias, such that the greater the self-contempt bias, the lower the self-esteem. This is in accordance with the hypothesis of Weiner [58] that attributions to stable and uncontrollable traits are particularly maladaptive for the individual. Critically, the correlation between self-blaming feelings and self-esteem was exclusive to self-contempt bias, with no such correlation occurring between self-esteem and guilt-proneness, further highlighting the importance of self-contempt biases in MDD. The relationship between the direction of blame (self vs. other) and self-esteem, however, is not limited to the patterns seen here, and such relationships are not restricted to MDD. On the contrary, in a model of paranoid ideation, Bentall et al. [59] associate decreased self-esteem with a tendency to make external rather than internal attributions in individuals with persecutory delusions. More research is required to link attributions and emotions and to explore their relationship with self-esteem in different psychiatric disorders.

Despite differences in emotional biases, we found no group differences in attributional style using the ASQ,

which is in keeping with the finding that explicitly assessed attributional abnormalities normalize upon remission of MDD [60, 61]. In contrast, other studies have shown a continuation of negative attributional styles into remission [62]. This discrepancy could be due to the attributional style of individuals with MDD being more labile than that of individuals with no history of depression. Indeed, it has been demonstrated that depressiogenic attributions can be induced with mild stressors in MDD [63]. In keeping with this finding, Teasdale's [64] differential activation hypothesis predicts depressiogenic cognitions only to be revealed in remitted MDD when inducing negative mood states. The experience of different emotions has long been linked to different attributional styles [13, 14], and these attributions are key antecedents for the experience of emotions [10, 58]; therefore, it could be argued that by investigating self- and other-blaming feelings, we were able to explore stable attributional differences in a more implicit and potentially more powerful way. Further factors that may have increased the sensitivity of finding group differences was that the VMST allowed people to fill personally relevant details into abstract stimuli (e.g. 'acts stingily' rather than contextualized examples of stingy behaviour), used a large number of items, and provided participants with a choice of emotional labels that captures different attributional styles.

Whilst we have provided new evidence on the importance of a self-contempt bias for vulnerability to MDD, we found no evidence of increased guilt-proneness when using the VMST that is based on the selection of subjective emotion labels, or the TOSCA-3 that assesses predefined constructs of guilt-proneness. A previous study showing increased guilt-proneness in remitted MDD [25] did not use the TOSCA-3 as a standard measure; therefore, a direct comparison with our results cannot be carried out. The findings of this study may have arisen by including statements reminiscent of self-contempt/disgust as part of the guilt-measure (e.g. 'Sometimes when I think about certain things I have done I almost get sick' [25]). Our remitted MDD group showed higher scores on IGQ measures of overgeneral forms of guilt (survivor guilt and omnipotent responsibility guilt), previously shown to be elevated in current MDD [21]. Interestingly, IGQ-guilt measures were not associated with an increased proneness to experience emotions that participants label as guilt, but with experiencing emotions participants refer to as self-contempt/disgust. These results are in keeping with the hypothesis that MDD vulnerability is associated with overgeneral forms of self-blame, but does not entail an increased proneness to experience adaptive forms of guilt.

While our task was not designed to measure agency-incongruent moral emotions, an exploratory analysis showed that people with remitted MDD display increased frequencies of self-blaming emotions when their best friend was the agent. This is in support of our overall conclusion of a self-blaming emotional bias in remitted MDD.

On a more cautionary note, one must consider two different although potentially related types of vulnerability to MDD. There is the primary underlying vulnerability to develop depression that exists prior to the occurrence of any depressive episode and the increased secondary vulnerability to develop further episodes following the first MDE that may be partly due to scarring effects arising from this first episode [65–67]. We were unable to identify whether the presence of a self-contempt bias in individuals with remitted MDD is due to primary or secondary vulnerability. These are inextricably linked such that secondary vulnerability develops from primary vulnerability and may increase in a cumulative fashion over the life span [65].

Taken together, by directly comparing different yet equally negative emotions that are directed towards self and others and that are associated with different types of blame (characterological and behavioural) in remitted MDD, this study provides the first direct evidence of a selective self-contempt bias rather than an overall increase in negative emotions. Future studies are needed to show whether self-contempt bias with relative reduction of contempt/disgust towards others is distinctive for subtypes of MDD resembling the sample studied here that was characterized by full remission, strong family history, high proportion of melancholic subtype patients, and no current comorbidity. Similar samples have been described before as showing a 'melancholic personality type' associated with an increased sense of duty and conscientiousness as well as high psychosocial functioning after remission [68]. Self-contempt bias could be a distinctive feature of melancholic as compared with other subtypes of depression, which may show different patterns of blame imbalances. This could be useful for cognitive stratification of depression in the future which is needed for optimization of treatment and prognosis. Future studies should investigate whether strong self-contempt bias in patients with remitted MDD indicates a higher risk of recurrence and a better response to cognitive-behavioural therapy with a specific focus on selective overgeneralization of self-blaming information.

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