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Emotional variability and clarity in depression and social anxiety

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ABSTRACT

Recent research has underscored the importance of elucidating specific patterns of emotion that characterise mental disorders. We examined two emotion traits, emotional variability and emotional clarity, in relation to both categorical (diagnostic interview) and dimensional (self-report) measures of major depressive disorder (MDD) and social anxiety disorder (SAD) in women diagnosed with MDD only ($n = 35$), SAD only ($n = 31$), MDD and SAD ($n = 26$) or no psychiatric disorder ($n = 38$). Results of the categorical analyses suggest that elevated emotional variability and diminished emotional clarity are transdiagnostic of MDD and SAD. More specifically, emotional variability was elevated for MDD and SAD diagnoses compared to no diagnosis, showing an additive effect for co-occurring MDD and SAD. Similarly diminished levels of emotional clarity characterised all three clinical groups compared to the healthy control group. Dimensional findings suggest that although emotional variability is associated more consistently with depression than with social anxiety, emotional clarity is associated more consistently with social anxiety than with depression. Results are interpreted using a threshold and dose–response framework.

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Maladaptive emotional experiences are central to the diagnoses of many mental health disorders, including mood and anxiety disorders. Diagnostic criteria of the *Diagnostic and Statistical Manual for Mental Health Disorders: DSM-5* (American Psychiatric Association [APA], 2013) for disorders that involve disrupted emotions frequently reflect anomalies in the magnitude of negative affect (NA) or positive affect (PA). Theorists and researchers have increasingly stressed the importance of comprehensively elucidating the range of emotional experiences beyond the most frequently investigated constructs, namely magnitude of NA and PA, that characterise individuals diagnosed with mental disorders (Berenbaum, Raghavan, Le, Vernon, & Gomez, 2003; Gross & Jazaieri, 2014; Kring, 2010; Kring & Bachorowski, 1999; Kring & Werner, 2004). Indeed, the National Institute of Mental Health Research Domain Criteria reflect a movement towards understanding the role of emotion in characterising multiple diagnoses (i.e., transdiagnostic processes).

Investigators have begun to characterise the emotional experiences of individuals with major depressive disorder (MDD) and social anxiety disorder (SAD). This study extends this literature with the central aim of identifying whether and how two specific emotion traits—emotional variability and emotional clarity—characterise individuals diagnosed with MDD, SAD, co-occurring MDD and SAD, and neither SAD nor MDD. We also examine whether emotional variability and emotional clarity are related to the severity of symptoms of depression and social anxiety.

We focused on MDD and SAD for several reasons. First, MDD and SAD are among the most common psychiatric disorders (e.g., Kessler et al., 1994). Second,

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MDD is the most highly comorbid disorder among those with a primary diagnosis of SAD; similarly, SAD commonly co-occurs in individuals with a primary diagnosis of MDD (e.g., Brown, Campbell, Lehman, Grisham, & Mancill, 2001). Third, elucidating the nature of the emotional experiences that characterise these two disorders may lead to a deeper understanding of their etiologies and courses, with the ultimate goal of increasing the effectiveness of approaches to prevention and treatment. Indeed, several empirically supported treatments incorporate components designed to reduce emotional variability (Dialectical Behavioral Therapy; Linehan, 2014) and increase emotional clarity (Trauma-Focused Cognitive Behavior Treatment; Cohen, Mannarino, & Deblinger, 2006).

Emotional variability is generally conceptualised as frequent and intense fluctuations in emotions (Diener, Larsen, Levine, & Emmons, 1985; Trull et al., 2008). In contrast, emotional clarity refers to the extent to which individuals can unambiguously identify, label and mentally represent the type (e.g., sadness, nervousness) and source of their own emotions (Coffey, Berenbaum, & Kerns, 2003; Gohm & Clore, 2000). Emotional variability and emotional clarity have been found to be inversely related in college student and community samples (Boden, Thompson, Dizen, Berenbaum, & Baker, 2013; Thompson, Dizen, & Berenbaum, 2009). Consistent with Thompson et al. (2009), we expect that over time higher emotional clarity will contribute to greater consistency in identifying, labelling and representing the potential sources and types of emotions experienced. Following, greater consistency will be associated with reduced emotional variability. In other words, by directly modulating emotional responses, emotional clarity is inversely associated with emotion variability.

Importantly, both emotional clarity and emotional variability have been broadly implicated in the development, maintenance and course of psychopathology (Berenbaum et al., 2003; Gross & Jazaieri, 2014). However, research on emotional clarity and emotional variability in MDD and SAD has largely been limited to examining the latter in those with MDD. Examining the extent to which emotional experiences are unique to MDD or SAD, characterise both disorders, or manifest differently in individuals with co-occurring MDD and SAD than in individuals with only one of these diagnoses, is important in understanding the nature and comorbidity of these clinical phenomena.

It is important that we assess these emotion traits in relation to MDD and SAD in the context of both categorical and dimensional classification systems. Examining these disorders categorically is important because in most clinical contexts diagnostic categories are utilized for, treatment planning and reimbursement. Elucidating patterns of emotional experiences associated with each diagnosis will increase clinicians' understanding of the disorder and facilitate the development and application of effective treatments (e.g., cognitive behavioural therapy; Butler, Chapman, Forman, & Beck, 2006). It is also important, however, to examine MDD and SAD using dimensional classification systems (also see Krueger & Piasecki, 2002), given that taxometric analyses indicate that depression and social anxiety may best be construed as dimensional (Haslam & Beck, 1994; Ruscio, 2010; Ruscio & Ruscio, 2000). Furthermore, symptoms of one of the disorders are often elevated in individuals who are diagnosed with the other disorder (e.g., Preisig, Merikangas, & Angst, 2001).

There is growing evidence that MDD is characterised by high levels of emotional variability (for a review, see Houben, Van Den Noortgate, & Kuppens, 2015). For example, individuals with MDD had higher levels of emotional variability than did healthy controls even after excluding individuals with MDD with any co-occurring anxiety disorders; however, the role of SAD was not tested specifically (Thompson et al., 2012). In the only study to examine emotional variability and SAD, individuals with SAD had greater emotional variability than did healthy controls, even after accounting for comorbid depressive disorders (Farmer & Kashdan, 2013). No research that has focused on emotional variability and MDD has explicitly focused on the role of SAD, and it is important that the findings described above be extended to this form of comorbidity.

Both individuals who are experiencing a major depressive episode (Loas et al., 1998) and individuals with a history of depression (Ehring, Fischer, Schnulle, Bosterling, & Tuschen-Caffier, 2008) have been found to report lower levels of emotional clarity than do individuals without a history of major depressive episodes. Although lower levels of emotional clarity have been found to be associated with greater severity of social anxiety symptoms (Salovey, Stroud, Woolery, & Epel, 2002; Turk, Heimberg, Luterek, Mennin, & Fresco, 2005), investigators have reported mixed findings in studies assessing emotional clarity in individuals

diagnosed with SAD. Whereas one study found that individuals with SAD reported lower levels of emotional clarity than did healthy controls (Miller, 2008), another found no difference in level of emotional clarity between individuals with and without SAD (McLaughlin, Mennin, & Farach, 2007). No research has examined emotional clarity in individuals with co-occurring MDD and SAD.

We assessed levels of emotional variability and emotional clarity in four groups of participants: people with diagnoses of MDD only, SAD only, co-occurring MDD and SAD (i.e., MDD + SAD) and healthy controls (i.e., CTL). Based on the findings described above, we predicted that having MDD and/or SAD would be associated with greater emotional variability and reduced emotional clarity. To the extent that psychiatric comorbidity is associated with emotion traits that are polarised (e.g., extremely high emotional variability) to an even greater extent than is the case in MDD or SAD alone, we explored the potential of an additive effect of having MDD and SAD for both emotional variability and emotional clarity. That is, we expected the MDD + SAD group to have higher levels of emotional variability and lower levels of emotional clarity than either the MDD or SAD group. For the dimensional assessments of depression and social anxiety, we hypothesised that depression and social anxiety symptom severity would be positively associated with emotional variability and negatively associated with emotional clarity. In addition to examining direct associations between emotion traits and MDD/depression symptom severity and SAD/social anxiety symptom severity, we conducted both categorical and dimensional analyses, adjusting for trait NA and PA, to test whether associations among emotion traits and diagnostic groups/symptom severities were attributable to trait NA and/or PA.

Method

Participants

Individuals were recruited from the community surrounding Stanford, California, through advertisements. A total of 130 women[1] participated after meeting criteria for one of four groups: (1) a current diagnosis of MDD (MDD group; $n = 35$); (2) a current diagnosis of SAD generalised (SAD group; $n = 31$); (3) current diagnoses of MDD and SAD generalised (MDD + SAD group; $n = 26$) or (4) no current or past history of any Axis I disorders (control group; $n = 38$). General eligibility requirements included fluency in English and being between 18 and 60 years old, and excluded individuals who met criteria for alcohol/substance abuse/dependence in the past six months.

Measures of clinical functioning

Individuals completed the *Structured Clinical Interview for DSM-IV Axis I Disorders* (SCID-I; First, Spitzer, Gibbon, & Williams, 2001), which was administered by extensively trained interviewers. Inter-rater reliability kappas for a random subset of 15 interviews ranged from 0.92 to 1.0 for the above diagnoses. *Depression symptom severity* was assessed using the Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996; Steer, Ball, Ranieri, & Beck, 1999). This self-report measure consists of 21 groups of statements describing various depressive symptoms. For each group of statements, participants chose the one that best reflects the degree to which they felt that symptom over the past two weeks. This measure has been shown to have good reliability and validity (Beck et al., 1996). For the current sample, Cronbach's α were as follows: MDD = 0.85, SAD = 0.87, MDD + SAD = 0.88 and CTL = 0.77. *Social anxiety symptom severity* was assessed with the Social Phobia and Anxiety Inventory (SPAI; Turner, Stanley, Beidel, & Bond, 1989). The SPAI is a 45-item measure of social anxiety symptoms. Using a 7-point scale (1 = *never*, 7 = *always*), participants indicated the extent to which they would feel anxious in a variety of situations with more than one person. For social anxiety symptom severity, we computed the difference between the agoraphobia and social phobia subscales. Cronbach's α for these composites were as follows: MDD = 0.95, SAD = 0.94, MDD + SAD = 0.88 and CTL = 0.94.

Measures of emotion traits

Emotional variability was assessed using the Affective Lability Scale—short form (ALS-SF; Oliver & Simons, 2004). Using a 4-point scale (1 = *very characteristic of me*, 4 = *very uncharacteristic of me*), participants rated the extent to which their mood shifts between what

[1]We recruited women for two reasons. First, women have higher rates of MDD and SAD than do men (APA, 2013). Second, low base rates of these disorders in men made equivalent recruitment across genders untenable, and recruiting fewer men would not have yielded adequate power to examine possible gender differences.

they consider to be their normal baseline to various affective domains and their tendency to oscillate between two affective states. The ALS-SF is highly correlated with the total score from the ALS (Harvey, Greenberg, & Serper, 1989; Oliver & Simons, 2004). The ALS-SF has been shown to be a good measure of overall emotional variability in student (Oliver & Simons, 2004) and clinical (Look, Flory, Harvey, & Siever, 2010) samples, demonstrating good convergent and discriminant validity in both. It has been found to have adequate temporal stability over four weeks in an undergraduate sample (Oliver & Simons, 2004). Internal consistency was high (Cronbach's $\alpha = .93$).

Emotional clarity was assessed using the emotional clarity scale of the difficulties in emotion regulation scale (Gratz & Roemer, 2004). Using a 5-point scale (1 = *almost never*, 5 = *almost always*), participants indicated the extent to which they agreed with each item. The emotional clarity scale has five items (e.g., "I have no idea how I am feeling"). Responses were scored so that lower scores indicated less emotional clarity. Self-report measures of emotional clarity have been found to be associated in theoretically predicted ways with scores on other self-report (Gohm & Clore, 2002) and behavioural/performance-based (Coffey et al., 2003; Dizen, Berenbaum, & Kerns, 2005; Gasper & Clore, 2000) measures. Internal consistency was good (Cronbach's $\alpha = .79$).

Levels of trait NA and PA were assessed using items from the affect intensity measure (AIM; Larsen, Diener, & Emmons, 1986). For the AIM, participants used a 6-point scale (1 = *never*, 6 = *always*) to indicate the extent to which they would react as described. A 6-item trait NA and 15-item trait PA were computed according to a factor analysis and were shown to have good discriminant validity (Bryant, Yarnold, & Grimm, 1996). The internal consistency was good for trait NA (Cronbach's $\alpha = .79$) and excellent for trait PA (Cronbach's $\alpha = .93$).

Procedure

The university Institutional Review Board approved the study protocol. After providing informed consent, participants completed a diagnostic assessment interview to determine eligibility (MDD, SAD, MDD + SAD or CTL). They then returned for a series of laboratory sessions, including completing the measures described above at the first session. Participants were compensated financially at $25 an hour.

Results

Demographic characteristics of each group are presented in Table 1. There were no significant group differences in age, race/ethnicity, education or number of children. We coded marital status as currently/not currently in a relationship; the groups did not differ in relationship status. Table 1 also presents group means and standard deviations of depression and social anxiety symptom severity.

Categorical classification

We conducted a two-way multivariate analysis of variance (MANOVA) with MDD/No MDD and SAD/No SAD diagnoses as the two independent variables and emotional variability and emotional clarity as the dependent variables. Multivariate tests (Wilks' λ) yielded significant main effects of MDD ($F(2,114) = 13.2$, $p < .001$, Partial $\eta^2 = .19$) and SAD ($F(2,114) = 21.0$, $p < .001$, Partial $\eta^2 = .27$) diagnoses, which were qualified by a significant interaction of MDD and SAD diagnoses ($F(2,114) = 4.1$, $p = .02$, Partial $\eta^2 = .07$).

We repeated the above analyses including trait NA and PA as covariates. The multivariate tests (Wilks' λ) yielded similar results to those obtained using the MANOVA without covariates, albeit with the significance of the main effect of MDD ($F(2,112) = 3.0$, $p = .051$, Partial $\eta^2 = .05$) and the interaction of MDD and SAD diagnoses ($F(2,112) = 2.8$, $p = .065$, Partial $\eta^2 = .05$) reduced to trend levels. The main effect for SAD continued to be significant ($F(2,112) = 5.2$, $p = .007$, Partial $\eta^2 = .09$).

To compare differences in emotion traits between each clinical group, we conducted one-way ANOVAs on emotional variability and emotional clarity with clinical group (MDD, SAD, MDD + SAD and CTL) as the independent variable. As shown in Table 2, both emotional variability and emotional clarity differed significantly as a function of diagnostic group, and this difference remained significant when repeating the analysis including trait NA and PA as covariates. Results from the analysis of covariance revealed that emotional variability and emotional clarity continued to differ significantly by clinical group. Post-hoc analyses excluding covariates[2] revealed that the MDD + SAD group

[2]Post-hoc tests could not be conducted in the analysis that included trait NA and PA.

Table 1. Demographic information and clinical symptoms presented by diagnostic group

	MDD ($n = 35$)	SAD ($n = 31$)	MDD + SAD ($n = 26$)	CTL ($n = 38$)	Difference test
Demographic Information					
Age, *M*(SD)	39.6 (11.9)	32.7 (12.5)	33.2 (11.7)	35.9 (12.1)	$F(3,1) = 2.25$, $p = .09$
Race/Ethnicity					$\chi^2_{(6)} = 4.22$, $p = .65$
European American (%)	70.6	71.0	73.1	65.8	
African American (%)	2.9	3.8	3.8	2.6	
Asian American (%)	8.8	12.9	3.8	18.4	
Latina (%)	5.9	3.2	11.5	–	
Native American/Alaska Native	–	3.2%	–	–	
Pacific Islander/Native Hawaiian	2.9%	–	–	–	
Other (%)	8.8	9.7	7.7	13.2	
Highest education completed					$\chi^2_{(9)} = 9.29$, $p = .41$
High school or less (%)	5.8	3.2	3.8	2.6	
Some college, technical school, associate's degree (%)	26.4	29.0	53.8	23.7	
Bachelor's degree (%)	47.1	38.7	30.8	47.4	
Graduate/professional degree (%)	20.6	29.0	11.5	26.3	
Marital Status					$\chi^2_{(3)} = 3.88$, $p = .28$
Single/divorced (%)	67.7	51.6	75.0	57.9	
Married/domestic partner/separated (%)	32.3	48.4	25.0	42.2	
Children, *M*(SD)	1.0 (1.2)	0.6 (1.1)	0.6 (1.1)	0.6 (1.0)	$F(3,1) = .93$, $p = .43$
Clinical symptoms					
Depression symptom severity, *M*(SD)	28.2 (10.0)	12.7 (8.2)	34.2 (11.6)	2.0 (3.2)	
Social anxiety symptom severity, *M*(SD)	66.6 (31.1)	105.6 (24.2)	111.4 (19.4)	34.2 (23.3)	

Notes: MDD, major depressive disorder group; SAD, social anxiety disorder group; MDD + SAD, group with comorbid MDD and SAD; CTL, healthy control group; *M*, mean; SD, standard deviation.

reported significantly higher emotional variability than did the MDD or SAD groups, who did not differ from each other. Notably, all three clinical groups reported higher emotional variability than did the CTL group. All three clinical groups reported similar levels of emotional clarity, which were significantly lower than were the levels reported by the CTL group.

Dimensional associations

We computed the zero-order correlations among the emotion traits and severity of depression and social anxiety symptoms. These correlation coefficients are presented by diagnostic group and for the entire sample in Table 3. Across the entire sample, as expected, severity of depression and social anxiety symptoms were positively correlated. Emotional variability was inversely correlated with emotional clarity. Both depression and social anxiety symptom severity were positively correlated with emotional variability and inversely correlated with emotional clarity.

Because significant correlations between emotion traits and symptom severity may be due to the variance shared among the emotion traits, we conducted two hierarchical multiple regression (HMR) analyses predicting symptom severity of either depression or social anxiety. In Step 1 of each HMR, we simultaneously entered emotional variability and emotional clarity to examine which emotion trait(s) significantly predicted depression or social anxiety symptom

Table 2. Descriptive statistic and results from analyses of (co)variance

	MDD	SAD	MDD + SAD	CTL	Omnibus F/Partial η^2
ANOVA, no covariates					
Emotional variability	$36.7\ (8.7)_b$	$38.7\ (10.1)_b$	$44.3\ (8.2)_c$	$26.1\ (8.3)_a$	24.3***/.39
Emotional clarity	$19.3\ (3.4)_b$	$18.8\ (3.7)_b$	$19.0\ (3.7)_b$	$22.4\ (1.9)_a$	9.7***/.20
ANCOVA, trait NA and PA included as covariates					
Emotional variability	35.9 (7.5)	36.3 (7.4)	39.9 (8.1)	31.4 (8.9)	4.0**/.10
Emotional clarity	19.7 (3.2)	18.8 (3.2)	19.7 (3.5)	21.6 (3.8)	3.1*/.08

Notes: ANOVA, analysis of variance; ANCOVA, analysis of covariance; MDD, major depressive disorder group; SAD, social anxiety disorder group; MDD + SAD, group with co-occurring MDD and SAD; CTL, healthy control group. Groups with different subscripts differ significantly from each other at $p < .024$. Means produced from the ANCOVA reflect estimated marginal means; post-hoc tests cannot be conducted on ANCOVAs.
*$p < .05$.
**$p < .01$.
***$p < .001$.

Table 3. Correlation coefficients between continuous variables for each diagnostic group and the total sample

	MDD	SAD	MDD + SAD	Control	Total
1) Emotional variability and emotional clarity	−0.26	−0.35	0.05	−0.48**	−0.43**
2) Emotional variability and depression symptom severity	0.55**	0.63**	0.42*	0.55**	0.67**
3) Emotional clarity and depression symptom severity	−0.14	−0.16	−0.18	−0.35*	−0.37**
4) Emotional variability and social anxiety symptom severity	0.07	0.00	−0.26	0.43**	0.51**
5) Emotional clarity and social anxiety symptom severity	−0.42*	−0.15	−0.02	−0.31	−0.45**
6) Depression symptoms severity and social anxiety symptom severity	0.03	0.06	0.18	0.21	0.47**

Notes: MDD, major depressive disorder group; SAD, social anxiety disorder group; MDD + SAD, group with comorbid MDD and SAD; CTL, healthy control group.
*$p < .05$.
**$p < .01$.

Table 4. Results of hierarchical multiple regression analyses predicting symptom severity

	Depression symptom severity			Social anxiety symptom severity		
	β	Semi-Partial R^2	Multiple R^2	β	Semi-Partial R^2	Multiple R^2
Step 1			.46***			.32***
Emotional variability	.62***	.32		.39***	.12	
Emotional clarity	−.10	.01		−.28**	.06	
Step 2			.62***			.37***
Emotional variability	.37***	.05		.19	.01	
Emotional clarity	−.02	.00		−.23**	.04	
Negative affect	.47***	.09		.34**	.05	
Positive affect	−.33***	.10		−.18*	.03	

*$p < .05$.
**$p < .01$.
***$p < .001$.

severity, adjusting for variance shared among emotion variables. In Step 2 of the HMRs, we entered trait NA and PA to examine whether the emotion traits that were identified as significant in Step 1 remained significant after adjusting for trait NA or PA.

As shown in Table 4, the two emotion traits together accounted for a statistically significant and substantial portion of the variance in symptom severity of both depression (46%; $F(2,115) = 48.1$, $p < .001$) and social anxiety (32%; $F(2,115) = 27.3$, $p < .001$). When unadjusted for trait NA or PA (Step 1), emotional variability significantly positively predicted severity of both depression and social anxiety symptoms; emotional clarity did not predict depression symptom severity but did significantly inversely predict severity of social anxiety symptoms. When adjusting for trait NA and PA (Step 2), emotional variability continued to be a significant predictor of symptom severity of depression but not of social anxiety, and emotional clarity continued to significantly inversely predict symptom severity of social anxiety.

Discussion

This study examined two emotion traits broadly implicated in several forms of psychopathology (e.g., Berenbaum et al., 2003; Gross & Jazaieri, 2014), including MDD and SAD. We carefully attended to the comorbidity of these two disorders, recruiting individuals with MDD without SAD, individuals with SAD without MDD, individuals with co-occurring MDD and SAD, and healthy controls. Recruiting individuals with MDD or SAD allowed us to examine emotion traits in each disorder in the absence of the other disorder. In addition, including the MDD + SAD group allowed us to examine whether the emotional experiences of individuals with both disorders were similar to or different from those experienced by individuals with only one disorder, and whether they presented additively, exponentially or otherwise. We also assessed dimensional levels of depression and social anxiety symptom severity, which uniquely add to our understanding of the associations between emotion traits and depression and social anxiety. As we discuss below, the obtained results highlight the

importance of considering both categorical and dimensional models of depression and social anxiety.

Consistent with our hypotheses, we found main effects of having a diagnosis of either MDD or SAD for emotional variability; we found further that people with MDD + SAD had the highest levels of emotional variability. These results suggest that emotional variability is a transdiagnostic factor or marker of MDD and SAD, and that there is an additive effect for emotional variability in those with MDD + SAD. Future research will benefit from investigating mechanisms or events accounting for changes in emotions for those with MDD, SAD and MDD + SAD. One interpretation is that different circumstances drive emotional variability for each disorder and that both continue to occur even in the presence of the other disorder. For example, emotional variability may be evident primarily during social interactions for individuals with SAD but during ruminative thinking for persons with MDD.

Consistent with these categorical findings, depression symptom severity was positively associated with emotional variability regardless of whether we controlled for levels of emotional clarity and trait NA and PA. These findings provide additional evidence for the importance of examining emotional variability in order to increase our understanding of MDD (Peeters, Berkhof, Delespaul, Rottenberg, & Nicolson, 2006). In contrast to depression symptom severity, the association between emotional variability and social anxiety symptom severity was less consistent. We found that the positive association between social anxiety symptom severity and emotional variability was no longer significant when we controlled for levels of emotional clarity and trait NA and PA. These findings suggest that relations between social anxiety and variability are better accounted for by emotional clarity and/or trait levels of NA and PA. Consistent with this formulation, Farmer and Kashdan (2013) found that after controlling for mean levels of NA (which are presumably highly associated with trait NA), CTL and SAD participants no longer differed from each other with respect to NA variability. It is important to note, however, that these researchers found that the interaction between SAD group (i.e., SAD or no SAD) and mean NA significantly predicted NA variability, highlighting the complexity of the relation between SAD and emotional variability. Integrating categorical and dimensional findings from this study suggests emotional variability plays a more consistent role in depression than in social anxiety.

We found that all three clinical groups had similarly lower levels of emotional clarity than did the healthy control group. Consistent with our hypothesis, these results suggest that emotional clarity is a transdiagnostic factor for MDD and SAD. The results of the dimensional analyses, however, painted a different picture. Emotional clarity uniquely predicted social anxiety, but not depression symptom, severity even after controlling for trait NA and PA. Similarly, although Ehring et al. (2008) found that a formerly depressed sample reported lower clarity of emotion than did their non-depressed peers, this group difference was no longer significant after NA "in the past weeks" was taken into account. Previous findings of significant inverse relations between emotional clarity and depression may be attributable to unassessed emotional variability and/or trait NA and PA. Thus, although emotional clarity is lower in individuals with MDD than in healthy controls, it does not appear to co-vary with depression symptom severity when accounting for emotional variability and/or trait NA and PA, suggesting that emotional clarity more comprehensively characterises and is associated with social anxiety than depression. There are several reasons why emotional clarity may be related to SAD and social anxiety symptom severity. For example, it may increase anxiety directly (Zimbardo, LaBerge, & Butler, 1993), and/or may limit individuals' choice and implementation of emotion regulation strategies that are most likely to reduce anxiety (Feldman Barrett & Gross, 2001). Thus, individuals with low emotional clarity might use strategies such as suppression and avoidance that paradoxically increase anxiety (Kashdan, Barrios, Forsyth, & Steger, 2006). To the extent that these reasons also underlie associations between emotional clarity and other types of psychopathology, future research is needed to identify when and why emotional clarity is associated with specific manifestations of psychopathology.

In addition to the limitation of the cross-sectional nature of study, our sample size was relatively small, although participants were carefully assessed to comprise homogeneous groups. Future research will benefit from examining similar topics in larger samples. We studied only women in this investigation and, although SAD and MDD are more common among women than among men (APA, 2013), it will be important to examine the extent to which our findings generalise to men. In addition, it is not clear that our results will continue to characterise MDD and SAD following recovery from these disorders. Although an

empirical examination is required to address this issue, we posit that the findings will generalise given that research has shown that emotional variability is also elevated in individuals who have recovered from MDD (Thompson, Berenbaum, & Bredemeier, 2011). Similarly, participants who have recovered from MDD have been found to report lower levels of emotional clarity than do people who were not previously depressed (Rude & McCarthy, 2003).

Another potentially fruitful avenue for future research on these emotion traits and MDD and SAD would be incorporating emotion regulation strategies. Both MDD and SAD are associated with the use of emotion regulation strategies that are generally maladaptive if used excessively. For example, MDD is associated with high levels of rumination (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), and SAD is associated with high levels of avoidance (e.g., Kashdan et al., 2014). Theory and research have suggested that: (a) emotional clarity contributes to depression via maladaptive emotion regulation (Boden & Thompson, 2015; Vine & Aldao, 2014); and (b) the link between emotional clarity and emotional variability may be characterised by the more frequent use of maladaptive emotion regulation strategies (Thompson et al., 2009). Thus, future research will benefit from examining pathways that link emotional clarity, emotional variability, and emotion regulation in MDD and SAD.

Finally, future research would benefit from conducting a multi-method assessment of emotional clarity and emotional variability, including laboratory and experience sampling methods (ESM), to replicate and extend the current findings. ESM could be used to indirectly assess emotional clarity and emotional variability, minimising reporting biases inherent to self-report measures, such as those used in the current study. In previous research, emotional clarity has been indexed by the speed by which participants rate their current affect, with quicker ratings presumably indicating greater emotional clarity (Lischetzke, Angelova, & Eid, 2011; Lischetzke, Cuccodoro, Gauger, Todeschini, & Eid, 2005). Thompson et al. (2015) successfully assessed emotional clarity in clinical samples using reaction times to ESM affect ratings. As an indirect assessment of emotional variability using ESM, researchers typically have participants report their current affect at each prompt. Variability is then computed using the participants' series of self-reports over the week. Thus, unlike in self-report trait measures, in ESM participants do not report how variable their emotions are; instead, variability is inferred from the repeated current affect ratings. Finally, using both ESM and experimental methods would also allow emotional clarity and emotional variability to be examined as a function of valence, which is not possible with the trait measures that were included in this study. This is an important question given evidence that, compared to non-depressed controls, individuals with MDD are characterised by higher emotional variability (Houben et al., 2015) and lower clarity of NA but not of PA (Thompson et al., 2015).

The present research makes several important contributions to the literatures focused on emotion, MDD and SAD. Our findings highlight the need to include groups and measures that will allow investigators to examine issues concerning the effects of diagnostic comorbidity on emotional functioning. For example, findings from the *DSM*-based MDD and SAD diagnoses suggested that both emotional variability and emotional clarity are transdiagnostic factors. On the other hand, findings from our examination of dimensional measures of the severity of symptoms of depression and social anxiety yielded stronger specificity than did category-based analyses, suggesting a more consistent relation between emotional variability and depression than is the case for social anxiety, and a more consistent association between emotional clarity and social anxiety than is the case for depression.

The fact that some of our findings varied as a function of how psychopathology was assessed underscores the importance of the recent impetus in the field to examine constructs dimensionally. In our discussion, we have focused primarily on findings that were consistent across the different forms of assessment. It is important to note, however, that this study provides an important opportunity to examine differences between the two systems of classification. We think that the dose–response and threshold model provides a useful framework for interpreting our findings. Dose–response relations often characterise treatment and prevention of psychopathology. For example, increasing doses of psychotherapy (Hansen, Lambert, & Forman, 2002) and physical activity (Dunn, Trivedi, Kampert, Clark, & Chambliss, 2005) have often been found to be associated with decreases in psychopathology. Alternatively, threshold models characterise relations in which one construct is associated with another to a different degree at different ranges of values. In fact, a threshold relation best characterises the association

between emotional clarity and MDD/depression: that low emotional clarity was associated more strongly with MDD, SAD and MDD + SAD than with healthy controls. Considered with the finding that emotional clarity was not associated with depressive symptom severity, our results suggest that some low level of emotional clarity must be reached before it will be associated with depression. Our results suggest further that the association between emotional clarity and SAD/social anxiety is characterised by both a dose–response and threshold relation, given that low levels of emotional clarity were associated with SAD and emotional clarity covaried inversely with the severity of social anxiety symptoms. Future research is needed to assess more explicitly the formulation that whereas dose–response and threshold-like effects characterised the relation between emotional variability and MDD/depression, only a threshold effect characterised the relation between emotional variability and SAD/social anxiety.

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