

# Worry, Anhedonic Depression, and Emotional Styles

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**Abstract** This study examined how elevated levels of worry and anhedonic depression are associated with affect intensity, attention to emotion, and clarity of emotion. University students ( $N = 923$ ) completed the Affect Intensity Measure, the Trait Meta Mood Scale, the Penn State Worry Questionnaire and the anhedonic depression subscale from the Mood and Anxiety Symptom Questionnaire. Control individuals with worry and depression scores below the median ( $n = 158$ ) were compared with three distress groups—elevated worry without elevated depression ( $n = 58$ ), elevated depression without elevated worry ( $n = 35$ ), and elevated levels of both worry and depression ( $n = 39$ ). The control and distress groups each differed significantly from one another, and these differences could not be accounted for by gender or neuroticism. Controls resembled individuals described in past research as being cerebral, the depression-only group resembled individuals described as being cool, the worry-only group resembled individuals described as hot, and the dual-distress group resembled individuals described as overwhelmed.

**Keywords** Depression · Worry · Emotion · Emotional awareness · Affect intensity

## Introduction

There is growing recognition that numerous facets of emotional experience are important for understanding

psychopathology (e.g., Berenbaum et al. 2003; Gratz and Roemer 2004; Mennin et al. 2007). The present research focused on affect intensity, attention to emotion, and clarity of emotion. These three emotional traits have been found to be distinguishable from one another and from the expression of emotion (Gohm and Clore 2000, 2002). Individuals with high affect intensity tend to experience intense pleasant and intense unpleasant emotion regardless of how frequently such states are experienced (Larsen and Diener 1987). Attention to emotion and clarity of emotion are two facets of emotional awareness that are prominent aspects of several related constructs such as emotional intelligence and alexithymia (Coffey et al. 2003; Gohm and Clore 2000). Attention to emotion refers to the extent to which one notices, thinks about, and monitors one's moods. Clarity of emotion refers to how clearly one knows and understands what one feels, and can discriminate among one's feelings. Although it is generally assumed that it is adaptive to pay more attention to, and to be clear about, one's emotions, past research has found that this is not always the case (e.g., Berenbaum et al. 2009; Lischetzke and Eid 2003).

Affect intensity, attention to emotion, and clarity of emotion have all been described as contributors to, or aspects of, emotion dysregulation (e.g., Gratz and Roemer 2004) and have been studied in relation to a wide variety of psychopathological outcomes. The present research focused on two forms of psychological distress, worry and anhedonic depression, that are the critical facets of the anxious-misery subfactor of internalizing disorders (comprised of generalized anxiety disorder (GAD), major depressive disorder (MDD), and dysthymia; Krueger 1999). The core feature of GAD is worry, which can be defined as repetitive thoughts about undesirable, uncertain outcomes, the experience of which is unpleasant (MacLeod et al.

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1991). Worry, which is also referred to as anxious apprehension and cognitive anxiety, is distinguishable from somatic anxiety/anxious arousal (e.g., Barlow 1991; Heller and Nitscke 1998). Whereas worry is the defining feature of GAD, anhedonic depression, which refers to the symptoms tied to decreased motivation and diminished pleasant mood, is specific to depressive disorders (Watson et al. 1995). Past research has demonstrated that worry and anhedonic depression are distinguishable, albeit correlated, facets of psychological distress (e.g., Nitschke et al. 2001). Previous research has also found that meaningful variations in both worry and anhedonic depression can be found in a wide variety of populations ranging from college students to clinical samples (e.g., Clark et al. 1998; Engels et al. 2010).

Previous research has found that higher levels of worry and higher scores on dimensional measures of GAD are associated with higher levels of affect intensity (Mennin et al. 2005; Mennin et al. 2007; Turk et al. 2005). Similarly, compared to non-distressed individuals, individuals with GAD tend to have higher levels of affect intensity (Mennin et al. 2005; Turk et al. 2005). Although previous research has not examined whether affect intensity is associated with either anhedonic depression or major depressive disorder (MDD), several studies have found that higher levels of affect intensity are associated with higher levels of depression as measured by instruments such as the Beck Depression Inventory (Flett et al. 1996; Mennin et al. 2005, 2007; Thorberg and Lyvers 2006). However, the magnitudes of the associations between affect intensity and depression have been smaller than the magnitudes of the associations between affect intensity and worry and dimensional GAD scores.

The results of previous research have revealed generally small and inconsistent associations between attention to emotion and both worry and depression. Attention to emotion is not associated with worry levels or GAD status in college students (Mennin et al. 2005; Salters-Pedneault et al. 2006; Turk et al. 2005). In contrast, a sample of treatment-seeking individuals with GAD (36% of whom had a comorbid MDD diagnosis) reported significantly greater attention to emotion than did a non-psychiatric control group (Mennin et al. 2005). Among college students, individuals with higher levels of depression (as measured by the Beck Depression Inventory) tended to report paying less attention to their emotions, though the association was very weak (Mennin et al. 2005). In contrast, Loas et al. (1998) found that individuals with MDD did not differ significantly from non-psychiatric controls in externally-oriented thinking (which past research has found is strongly negatively correlated with attention to emotion; e.g., Coffey et al. 2003).

Previous research has found that higher levels of worry and higher scores on dimensional measures of GAD are

associated with lower levels of emotional clarity (Mennin et al. 2005, 2007; Salters-Pedneault et al. 2006; Turk et al. 2005). Similarly, compared to non-distressed individuals, individuals with GAD tend to have lower levels of emotional clarity (Mennin et al. 2005; Salters-Pedneault et al. 2006; Turk et al. 2005). Past research has also found that individuals with elevated levels of depressive symptoms (as measured by the Beck Depression Inventory) tend to have lower levels of emotional clarity (Mennin et al. 2005, 2007). Loas et al. (1998) found that compared with non-psychiatric controls, individuals with MDD had more difficulty identifying their feelings. More recently, Ehring et al. (2008) found that college students with past major depressive episodes reported lower levels of emotional clarity than did never-depressed college students.

In the current research, we attempted to extend previous research in several important ways. First, based on the recommendation that correlates of anxiety and depression can be misleading or masked when not taking into account their comorbidity/covariation (e.g., Bradley et al. 1995; Engels et al. 2010; Heller and Nitscke 1998), we compared individuals who were not distressed (control group) with three distinct groups of distressed individuals: (a) individuals with elevated levels of worry in the absence of elevated levels of anhedonic depression (worry group); (b) individuals with elevated levels of anhedonic depression in the absence of elevated levels of worry (depression group); and (c) individuals with elevated levels of both worry and anhedonic depression (dual distress group).

The second way in which we attempted to extend previous research was by attempting to rule out gender and neuroticism as potential third variable explanations for the links between distress and emotional awareness and affect intensity. This is important because past research has found that females are more likely than males to exhibit elevated levels of distress (e.g., Piccinelli and Wilkinson 2000), and gender differences have also been found in emotional awareness (e.g., Ciarrochi et al. 2005) and emotional intensity (e.g., Diener et al. 1985). Similarly, elevated levels of trait negative affect/neuroticism are associated with psychopathology and distress (e.g., Watson et al. 2005), and neuroticism has been found to be associated with emotional awareness (Luminet et al. 1999).

Our hypotheses were guided by previous research (Gohm 2003; Kerns and Berenbaum 2010) that has consistently identified (across five samples with an average sample size of 252) the following four multivariate clusters of individuals: (a) *emotionally hot* individuals, who have elevated levels of intensity, attention, and clarity; (b) *emotionally cool* individuals, who have diminished levels of intensity, attention, and clarity; (c) *emotionally*

*overwhelmed* individuals, who are less clear than emotionally intense or attentive; and (d) *emotionally cerebral* individuals, who are more clear than emotionally intense or attentive.<sup>1</sup> We refer to these patterns of emotional intensity and awareness as emotional styles. Previous research has found that emotionally hot individuals are most strongly affected by mood manipulations (Gohm 2003); emotionally cool individuals are least reactive to mood manipulations (Gohm 2003); and emotionally overwhelmed individuals try to avoid emotional experiences and information (Gohm 2003; Kerns and Berenbaum 2010). Emotionally overwhelmed individuals report paying increased attention to their emotions even though the evidence indicates they try to avoid emotional experiences and information. This apparent discrepancy can be reconciled if one recognizes the difference between motivation to avoid emotional experience and the degree to which individuals actually attend to their emotions (which may occur involuntarily).

Our hypotheses regarding worry were influenced by: (a) the avoidance model of worry proposed by Borkovec (1994) and more recent extensions of the avoidance model emphasizing the role of experiential avoidance (e.g., Roemer et al. 2005); and (b) previous theorizing and research suggesting that “individuals with GAD have emotional reactions that occur more easily, quickly, and intensely than for most other people” (Mennin et al. 2005, p. 1283). We therefore hypothesized that individuals with elevated levels of worry would have patterns of emotional intensity, attention, and clarity that resembled those of either: (a) individuals most inclined to avoid emotional experiences and information (i.e., emotionally overwhelmed individuals); or (b) individuals most likely to react strongly to affect eliciting events, cognitions, and experiences (i.e., emotionally hot individuals). Our hypotheses regarding depression in the absence of co-occurring elevations in worry were influenced by the emotion context insensitivity model of depression (e.g., Rottenberg et al. 2005) which proposes that depression is associated with disengagement and diminished emotional reactivity. Our hypotheses regarding worry varied depending on whether there is co-occurring anhedonic depression. Similarly, our hypotheses regarding anhedonic depression varied depending on whether there is co-occurring worry. Descriptions of the different emotional styles, along with our hypotheses, are summarized schematically in Fig. 1.

<sup>1</sup> Although not reported in this paper, a k-means cluster analysis using the standardized affect intensity, attention, and clarity scores in the present sample replicated the four group solution described by Gohm (2003) and Kerns and Berenbaum (2010).

## Dual-distress group hypotheses

Based on the evidence that a pattern of experiential avoidance is associated with both worry and depression (e.g., Hayes et al. 2004; Roemer et al. 2005; Tull et al. 2004), coupled with the evidence that emotionally overwhelmed individuals try to avoid emotional experiences and information (Gohm 2003; Kerns and Berenbaum 2010), we hypothesized that individuals with elevated levels of both anhedonic depression and worry would resemble individuals with an emotionally overwhelmed style (i.e., they would be less clear than emotionally intense or attentive).

## Worry group hypotheses

Based on the evidence that individuals with GAD are highly emotionally reactive, and that mood manipulations are particularly effective and long lasting for emotionally hot individuals (Gohm 2003), we hypothesized that individuals with elevated levels of worry in the absence of elevated anhedonic depression would resemble individuals with a hot emotional style (i.e., they would have elevated levels of intensity, attention, and clarity).

## Depression group hypotheses

Since individuals with major depressive disorder tend to be less emotionally reactive to both pleasant and unpleasant stimuli (Bylsma et al. 2008), and emotionally cool individuals are least reactive to mood manipulations (Gohm 2003), we hypothesized that individuals with elevated anhedonic depression in the absence of elevated worry would resemble individuals with a cool emotional style (i.e., they would have diminished levels of intensity, attention, and clarity).

## Control group hypotheses

Given the preceding hypotheses, we also expected non-distressed individuals to resemble individuals with a cerebral style (i.e., they would be more clear than emotionally intense or attentive).

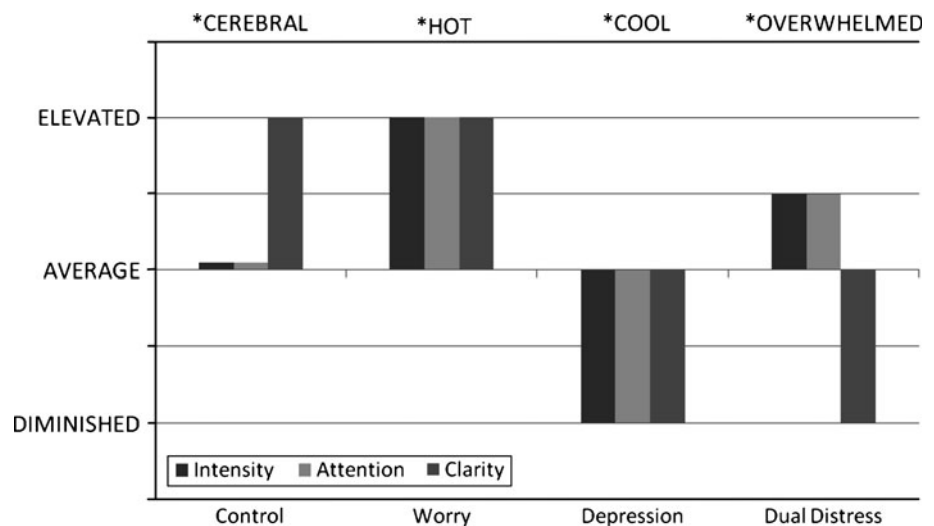
## Method

### Participants

Participants were 923 students (51.6% female<sup>2</sup>) from a large Midwestern university, ranging in age from 17 to

<sup>2</sup> Demographic information (e.g., gender) was missing for 41 participants.

**Fig. 1** Descriptions of the different emotional styles and summary of hypotheses



28 years ( $M = 19.3$ ;  $SD = 1.3$ ). Most (62.4%) of the participants reported being European-American; 21.1% were Asian American; 5.4% were African American; 6.4% were Latina; 1.9% were Biracial; and 2.7% selected the descriptor “other.” Participants received partial credit toward a research participation requirement in exchange for their participation.

## Measures

### *Affect Intensity*

Affect intensity was measured using the Affect Intensity Measure (AIM; Larsen et al. 1986). This 40-item questionnaire measures trait levels of affect intensity. A sample item from the AIM is “My emotions tend to be more intense than those of most people.” The AIM has been shown to have good internal consistency and good discriminant validity (Larsen et al. 1986). Internal consistency of the AIM, measured using Cronbach’s alpha, was .88.

### *Emotional attention and clarity*

Attention to emotion and clarity of emotion were measured using relevant subscales of the Trait Meta-Mood Scale (TMMS; Salovey et al. 1995). The 14-item Attention to Emotion scale assesses the amount of awareness and thought that individuals allocate to their emotions (e.g., “I often think about my feelings”). The 10-item Clarity of Emotion scale assesses the degree to which individuals are able to understand and identify their feelings (e.g., “I am rarely confused about how I feel”). Self-reported measures of attention to emotion and clarity of emotion, including the TMMS, have been found to be associated with scores on other self-report questionnaires in theoretically predicted ways (Gohm and Clore 2002), as well as with

behavioral/performance-based measures (e.g., Coffey et al. 2003; Dizen et al. 2005). The internal consistencies of the Attention and Clarity scales were .86 and .85, respectively.

### *Worry*

Worry was measured using the Penn State Worry Questionnaire (PSWQ; Meyer et al. 1990). The PSWQ is composed of 16 items (e.g., “My worries overwhelm me”) Past research has indicated that the PSWQ has excellent test–retest reliability and good convergent and discriminant validity (Meyer et al. 1990; Nitschke et al. 2001). Internal consistency of the PSWQ was .94.

### *Anhedonic Depression*

Anhedonic depression was measured using the relevant subscale from the Mood and Anxiety Symptom Questionnaire (MASQ; Watson et al. 1995). The anhedonic depression subscale is composed of 22 items (e.g., “felt like nothing was very enjoyable”) Past research has indicated that the anhedonic depression subscale has good convergent and discriminant validity (Nitschke et al. 2001; Watson et al. 1995). Internal consistency of the anhedonic depression subscale was .92.

### *Neuroticism*

Neuroticism was measured using the 10-item scale from the International Personality Item Pool (IPIP 2001). Sample items include “get stressed out easily.” Higher scores on this scale reflect lower levels of neuroticism (and higher levels of emotional stability). This scale has been found to have good psychometric properties and reasonable evidence of convergent and discriminant validity (Goldberg 1999; Lim and Ployhart 2006). For example, Lim and

**Table 1** Descriptive statistics for and correlations among variables

	Worry	Anhedonic depression	Neuroticism	Attention	Clarity	Affect intensity
Anhedonic depression	.31					
Neuroticism	.71	.44				
Attention	.11	-.18	.10			
Clarity	-.33	-.36	-.41	.17		
Affect intensity	.37	-.12	.37	.38	-.12	
Observed range	16–80	22–103	10–48	18–70	10–50	93–213
<i>M</i>	49.8	52.9	27.3	54.4	36.3	148.4
<i>SD</i>	14.7	14.1	7.5	8.5	6.9	20.4

Note All correlations were statistically significant ( $p < .01$ )

Ployhart found that the IPIP neuroticism scale was quite strongly correlated,  $r = .76$ , with neuroticism as measured by the NEO-FFI. Internal consistency of this scale was .87.

## Results

Descriptive statistics for and correlations among the variables can be found in Table 1. We divided participants into four groups based on their worry and anhedonic depression scores. We selected cutoffs based on the results of previous research (Behar et al. 2003; Bredemeier et al. in press; Buckby et al. 2007; Fresco et al. 2003) that conducted receiver operating curve (ROC) analyses to examine the ability of the PSWQ and MASQ anhedonic depression scale to identify individuals with GAD and depressive disorders, respectively. Based on this past research, individuals with PSWQ scores of 65 or higher were considered to have significant levels of worry, whereas individuals with anhedonic depression scores of 70 or higher were considered to have significant levels of depression. The four distress groups were: (1) a worry group ( $N = 58$ ; 80.7% female) whose PSWQ scores were 65 or higher whose anhedonic depression scores were below the median; (2) a depression group ( $N = 35$ ; 30.3% female<sup>3</sup>) whose anhedonic depression scores were 70 or higher whose PSWQ scores were below the median; (3) a dual-distress group ( $N = 39$ ; 60.5% female) whose PSWQ scores were 65 or higher and whose anhedonic depression scores were 70 or higher; and (4) a control group ( $N = 158$ ; 43.7% female) whose PSWQ and anhedonic depression scores were both below the median but above the 10th percentile.<sup>4</sup> Descriptive statistics for each of these four distress groups are presented in Table 2.

<sup>3</sup> Other researchers using the same selection criteria have also found that individuals with elevated levels of anhedonic depression but not elevated levels of worry are more likely to be male than female (Engels et al. 2010; Herrington et al. 2010).

<sup>4</sup> Individuals with scores at or below the 10th percentile were excluded so that: (a) the worry and anhedonic depression scores of individuals in the control group would not be lower than those of

We began by conducting a multivariate analysis of variance (MANOVA) using distress group as the independent variable and affect intensity, attention to emotion, and clarity of emotion as the dependent variables.<sup>5</sup> As expected there was a significant effect of distress group,  $F(3,280) = 23.02$ ,  $p < .01$ . The mean intensity, attention, and clarity scores for each of the four distress groups are illustrated in Fig. 2. As predicted, and as can be seen in Fig. 2, the worry group's scores resembled those of individuals described in past research (Gohm 2003) as hot, the depression group's scores resemble those of individuals described as being cool, the dual-distress group's scores resembled those of individuals described as overwhelmed, and the control group's scores resemble those of individuals described as being cerebral.<sup>6</sup> The results of post hoc comparisons across groups are also depicted in Fig. 2.

In follow-up analyses, we conducted binary logistic regression analyses, using affect intensity, attention to emotion, and clarity of emotion as predictors, to compare every possible pair of distress groups (e.g., controls vs. worry; depression vs. dual-distress). Every group differed significantly from every other group (all  $p$ 's  $< .01$ ). We next examined whether the distress groups differed after taking into account gender by conducting binary logistic regression analyses, using distress group as the dependent variable, entering gender in the first step, and entering in the second step intensity, attention and clarity. Even after taking into account gender, the addition of intensity, attention, and clarity significantly improved the ability to distinguish between all pairs of groups (all  $ps < .01$ ). We then conducted similar analyses in which neuroticism was entered in the first step. Even after taking into account

Footnote 4 continued individuals in the depression and worry groups, respectively; and (b) we would not be comparing the distress groups with a control group that included individuals with unusually low levels of distress.

<sup>5</sup> Gender did not significantly moderate any of the results presented below.

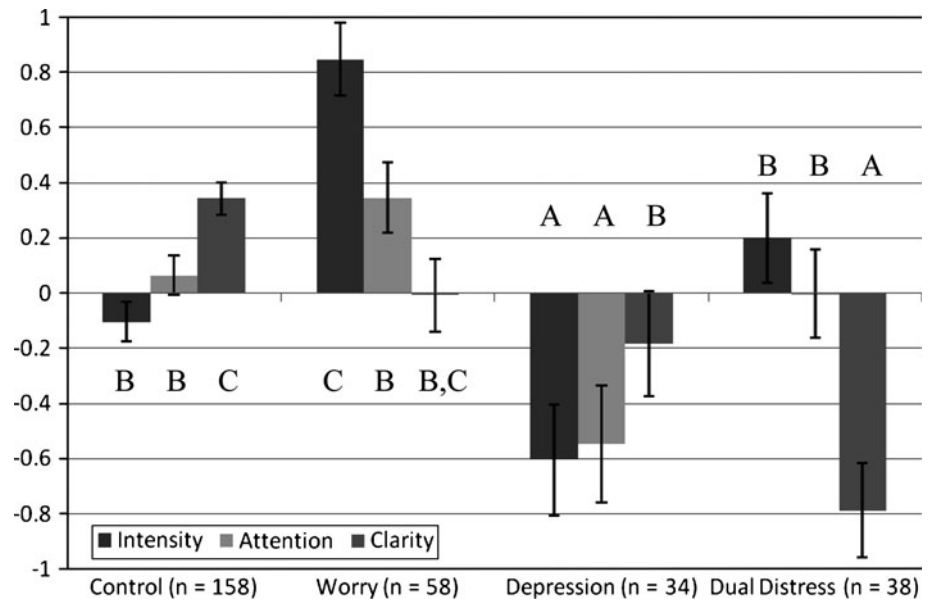
<sup>6</sup> The results of analyses using cluster group membership instead of the mean affect intensity, attention, and clarity scores, which led to the same conclusions, are available upon request.

**Table 2** Mean (SD) distress and neuroticism scores for individuals in the four distress groups

	Control	Worry	Anhedonic depression	Dual distress
Worry	40.2 (5.5)	71.8 (4.1)	41.1 (5.7)	71.8 (4.4)
Anhedonic depression	44.1 (4.0)	42.8 (6.3)	76.7 (5.9)	80.5 (8.2)
Neuroticism	36.9 (4.8)	26.5 (5.2)	31.9 (6.2)	23.0 (4.6)

Note Dual distress = elevated levels of worry and anhedonic depression

**Fig. 2** Mean levels of standardized intensity, attention, and clarity (+SE) in the four distress groups. Note Those groups with a common letter above/below the bar representing their mean score did not differ significantly, whereas groups with different letters did differ significantly



neuroticism, with only one exception (comparing depression-only with dual-distress), the addition of intensity, attention, and clarity significantly improved the ability to distinguish among pairs of groups (worry vs. control,  $p < .05$ ; remaining  $ps < .01$ ).

## Discussion

Perhaps the most important finding of the present study is that the manner in which emotional intensity, attention, and clarity are associated with worry and depression depends on the particular combination of worry and anhedonic depression an individual exhibits (i.e., depression without worry, worry without depression, and both worry and depression). Thus, the results of this study reveal the importance of taking into account depression when examining correlates of worry, and of taking into account worry when examining correlates of depression.

Consistent with past research, we found that elevated levels of worrying and depression were associated with individual differences in affect intensity, attention to emotion, and clarity of emotion. The present findings expand our understanding of the relations between distress and emotional style in two particularly noteworthy ways.

First, intensity, attention to emotion, and clarity of emotion not only distinguished distressed individuals from controls, but distinguished among individuals with different patterns of distress. Thus, our results cannot be accounted for by the tendency of distressed individuals to exhibit a negativistic response bias on self-report instruments. It remains possible, however, that at least some of the findings we report are exaggerated due to the exclusive reliance on self-report; ideally, future research will employ multiple methods. Second, the associations between distress and emotional style could not be entirely accounted for by either gender or neuroticism. This provides evidence of the incremental validity of emotional style and raises the possibility that emotional style may be important for understanding the development of different patterns of psychological distress.

Of course, the cross-sectional nature of our data prevents us from being able to draw conclusions regarding causality. However, because of their roles in emotion regulation (Feldman Barrett et al. 2001), we hypothesize that emotional intensity, attention, and clarity are associated with vulnerability to psychological distress. Thus, we would like to offer several hypotheses that will need to be tested in future research. First, we hypothesize that a hot emotional style leads to the emotional impact of stressors being longer lasting, which, in turn, leads to worries being longer

lasting and more difficult to control. This is consistent with the findings that emotionally hot individuals are most strongly affected by mood manipulations (Gohm 2003). Second, we hypothesize that a cool emotional style is part of a larger pattern of disengagement from emotion, people, and goals. Such disengagement could contribute to anhedonia, diminished emotional reactivity, and affective flattening, all of which are associated with MDD (e.g., Berenbaum and Oltmanns 1992; Bylsma et al. 2008). This is consistent with research by Gohm (2003) who found that emotionally cool individuals are least reactive to mood manipulations. Third, we hypothesize that an overwhelmed emotional style leads to a pattern of experiential avoidance, which, in turn, predisposes to the full range of psychological distress because the avoidance leads to problems not being solved and challenges not being met. This is consistent with the findings that emotionally overwhelmed individuals try to avoid emotional experiences and information (Gohm 2003; Kerns and Berenbaum 2010).

Although participants in the present research were college students, they were selected on the basis of having PSWQ and MASQ anhedonic depression scores found to optimally distinguish controls from individuals with GAD and depressive disorders, respectively (Behar et al. 2003; Bredemeier et al., *in press*; Buckby et al. 2007; Fresco et al. 2003). It is worth noting that the mean PSWQ scores of individuals in the worry and dual-distress groups ( $M = 71.8$  for both groups) were higher than the mean PSWQ scores of individuals diagnosed with Generalized Anxiety Disorder (e.g., Behar et al. 2003; Fresco et al. 2003; Amir et al. 2009). The mean MASQ anhedonic depression scores of individuals in the depression and dual-distress groups ( $M = 76.7$  and  $M = 80.5$ , respectively) were higher than the mean anhedonic depression scores of mixed psychiatric patients (Watson et al. 1995;  $M = 65.5$ ) and of individuals referred to a mental health clinic for adolescents and young adults (Buckby et al. 2008;  $M = 75.8$ ), though slightly lower than the mean of hospitalized medical patients with depressive disorders (Clark et al. 1998;  $M = 81.3$ ). Thus, it is likely that most individuals in the depression, worry, and dual-distress groups had clinically significant levels of distress, and that a majority had diagnosable mental disorders. Nonetheless, it will be important to determine whether our results will replicate in samples of treatment-seeking individuals.

Future research should attempt to replicate our findings using a sample that is older and more diverse than was examined in the present study. It will also be important to examine how emotional styles are associated with specific emotional disorders, such as MDD and GAD. Along the same lines, it will be important to determine whether the findings of the present research regarding depression are

specific to anhedonic depression or are common to all manifestations of depressive disorders. Similarly, it will be important for future research to examine how emotional styles are associated not only with worry and different anxiety disorders, but also with other facets of anxiety (e.g., examining somatic anxiety as well as cognitive anxiety). Finally, to explore the issue of causality, longitudinal research as well as true experiments manipulating affect intensity and emotional awareness is needed (e.g., Boden and Berenbaum 2007; Moon and Berenbaum 2009). Although additional questions remain, the results of the present study suggest important avenues for future research along with clues that may help untangle the puzzle of why some individuals develop only depression, some develop only worry, and some develop both types of distress.

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