ATTENUATED NEGATIVE AFFECT DIFFERENTIATION
UNIQUE TO INDIVIDUALS WITH TRAIT ANXIETY

A thesis submitted
To Kent State University in partial
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Degree of Master of Arts

by
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Introduction

Affect refers to emotions as they are described with language (Russell, 1978). Indeed, the way in which emotions are described varies greatly from person to person. Some individuals use general terms such as “pleasant” and “unpleasant” when discussing their emotional experiences. However, others may employ greater specificity, for example, pleasant experiences can be characterized as feelings of joy, happiness, and affection while unpleasant experiences can be reported as feelings of anger, sadness, and guilt (Barrett, 1998; Barrett, Gross, Christensen, & Benvenuto, 2001). The ability to effectively differentiate likely relies on higher or second-order elaborative processing (Damasio, 1999). Growing research has demonstrated the benefits of being able to differentiate between emotions of the same valence. This ability has been shown to support emotion regulation strategies and to be protective during times of stress (Barrett et al., 2001; Kashdan, Ferssizidis, Collins, & Muraven, 2010). A lack of differentiation, however, has been reported in individuals experiencing psychopathology (Demiralp et al., 2013; Zaki, Coifman, Rafaeli, Berenson, & Downey, 2013). While the evidence accumulates suggesting that differentiation has clear adaptive benefits, our understanding of what contributes to deficits is still strikingly limited. Given that affect differentiation strategies are implicated in a variety of disorders, how differentiation relates to broader dispositional characteristics of psychopathology is of particular interest.
In this investigation, we focus on dispositional or trait anxiety. Trait anxiety is the tendency to focus on threatening stimuli and to have difficulty disengaging from these stimuli once they are detected. Once anxiety is activated by threat it becomes difficult to override it with conscious cognitive control. Further, anxiety is thought to narrow both attentional and cognitive resources and results in an emphasis on automatic encoding at the expense of more elaborate higher order processing (Mineka & Ohman, 2002; Mathews & Mackintosh, 1998). Given that affect differentiation likely relies on this more elaborate or higher order processing, our current research explores how trait anxiety may be related to the ability to differentiate.

Trait anxiety is a relatively stable proneness that predicts heightened responses to and lower thresholds for detecting threat (Spielberger, 1972). It is thought to be a key risk factor for anxiety disorders and shares considerable overlapping features with depression and general negative affect (Bieling, Antony, & Swinson, 1998; Bados, Gomez-Benito, & Balaguer, 2010). The experience of anxiety and fear are known to signal appropriate preparatory responses in situations in which our survival is threatened (Panksepp, 1988). Individuals who are anxiety-prone, however, may perceive ambiguous stimuli as threatening and respond to both real and imagined threat in an automatic way with little conscious cognitive analysis.

A number of experimental paradigms have demonstrated a link between trait anxiety and attentional bias for negative information. Dot probe and dichotic listening tasks indicate that high trait anxious (HTA) individuals respond more quickly to a probe or tone presented in the same area previously occupied by a threat-related stimuli (Fox,
2002; Eysenck, MacLeod, & Mathews, 1987). Fox (2002) found that this response was strongest for masked stimuli, suggesting that the attentional biases of HTA individuals may rely on subconscious processing. A similar task that utilized facial morphing found that HTA individuals attended to faces at an earlier intermediate level of threat, while low trait anxious individuals attended to faces at only a more extreme level (Wilson & MacLeod, 2003). These findings suggest that HTA individuals may have both a threat-sensitive and hypervigilant attentional system.

In addition to having selective attention to and a lower threshold for detecting threat, a considerable body of evidence suggests that high trait anxious individuals may also have difficulty disengaging their attention once a threat is detected. For example, those with high trait anxiety took longer to disengage attention from negative (vs. positive) pictures (Yiend & Mathews, 2001) and from threatening facial expressions (Fox, Russo, Bowles, & Dutton, 2001; Fox, Russo, & Dutton, 2002). HTA individuals also have difficulty identifying neutral targets surrounded by negative distracters (Bryne & Eysenck, 1995). Rudaizky, Basanovic, and MacLeod (2014) utilized a task that assessed both the aforementioned tendency toward and difficulty disengaging from threatening stimuli and found both to be independent characteristics of high trait anxiety. The fear and anxiety that occur in response to these threatening stimuli rely on automatic processing. Once activated, this processing is relatively impenetrable to conscious cognitive control (Mineka & Ohman, 2002). HTA individuals likely rely more on this low-level automatic processing given their tendency to experience more situations as
threatening, and in doing so may exhaust the majority of their cognitive resources leaving little room for higher-order processing.

In line with these findings, Brewin (2001) has suggested that those who are anxious may store threat information in nonverbal form, thus avoiding perceptual encoding of threat by not semantically elaborating on their feelings. The encoding and elaboration of emotions occurs after multiple automatic processing steps, and relies on second or higher-order processing (Damasio, 1999). A lack of semantic elaboration of feelings is often referred to as alexithymia. Alexithymia is characterized by the inability to identify one’s feelings and to describe them to others, and is commonly assessed with self-report measures that ask individuals to accurately report on their general abilities to describe and label emotions (Bagby & Taylor, 1997). Marchesi, Brusamonti, and Maggini (2000) found that difficulty identifying and communicating one’s own feelings was high in anxious individuals (see also Turk, Heimberg, Luterek, Mennin, & Fresco, 2005; Berthoz, Consoli, Perez-Diaz & Jouvent, 1999).

Although related to alexithymia, affect differentiation more specifically captures how an individual segregates and distinguishes emotional experiences of a similar valence from one another. Differentiation is typically assessed by asking individuals to rate their affective experiences repeatedly across time. Doing so allows individuals to report their emotional experiences in real-time rather than making a generalized ability rating. Further, this method may reduce social desirability biases (Kashdan & Farmer, in press) and generally increases the validity and predictive utility of the assessment (Zaki et al, 2013). When assessed this way, the ability to successfully differentiate is reflected in
less association between negative (anger, sadness, guilt) or positive words (enjoyment, happiness, affection), indicating that individuals are able to identify a particular emotion word for the way they are currently feeling. In contrast, poor differentiators show a strong association between affect terms of similar valence (Barrett et al., 2001). These large associations indicate that words like fear, sadness, and distress are all being rated similarly, suggesting the individual is having difficulty discriminating between words and difficulty identifying a particular emotion word to describe how they feel following a given experience.

Research on differentiation thus far suggests that it may have a variety of benefits. During high levels of emotional intensity, differentiation supports emotion regulation strategies such as distraction and self-soothing (Barrett et al., 2001) and has been shown to mediate the negative relationship between emotional lability and mindfulness (Hill & Updegraff, 2012). Affective differentiation is also known to be protective during times of stress. For example, Kashdan et al. (2010) found that individuals with more intense negative emotional experiences consumed less alcohol if they were better able to describe their emotions and relied less on global descriptions. In times of anger, high emotion differentiators report less aggressive tendencies, less frequent provocation in daily life, and less aggression in response to being provoked (Pond et al., 2012). Further support comes from the work of Tugade, Fredrickson, and Barrett (2004) who found that positive affective differentiation is associated with less self-reported automatic responses, less mental self-distractions during stress, and more engagement in coping processes. In regards to health behaviors, differentiation of negative affect during the course of chronic
illness was found to be associated with greater treatment adherence (Coifman, Ross, Kleinart, & Giardana, 2013).

To date, there are two mechanisms that may explain how affective differentiation, and more specifically the ability to label affect, can be beneficial. Schwarz and Clore’s (1983) affect-as-information model posits that discrete affect labels provide information on how to appropriately cope with and best respond to emotional experiences (see also Schwarz & Clore, 1988; Schwarz, 1990). Alternatively, others suggest that affect labeling may impact emotion processing at a more implicit level. Hariri, Bookheimer, and Mazziotta (2000) found that the act of labeling of angry and frightened expressions is associated with diminished regional cerebral flow in the amygdala, a brain area known to be associated with emotional reactivity, and increased regional cerebral blood flow to the prefrontal cortex, an area implicated in emotion regulation. Additional work by Lieberman and colleagues (2007) supports these findings, and suggests that affect labeling of negative emotional images diminishes amygdala and other limbic region activity via medial prefrontal cortex mediation.

More recent research on the other end of the spectrum suggests that the inability to differentiate may be problematic. In clinical and nonclinical samples, depressed individuals report less differentiated negative affect than controls (Erbas et al., 2014; Demiralp et al., 2012). Additionally, low differentiation was shown to interact significantly with rumination in borderline personality disorder to predict higher rates of nonsuicidal self-injury acts and urges (Zaki et al., 2013). The aforementioned Tugade et al. (2004) finding is one of the few studies to examine the differentiation of positive
emotions. The majority of this work to date in this area has focused on the differentiation of negative emotions, likely due to their predominance in psychopathology.

Our current interest lies in whether those who are trait anxious, and thus prone to more automatic processing, may be able to engage in the higher order processing necessary for successful differentiation of their emotional experiences. Should high trait anxious individuals experience trouble differentiating it follows that they will also not reap its associated benefits.

The Current Study

While recent work suggests that affect differentiation is significantly related to well-being, little work to date has explored how differentiation relates to dispositional tendencies, such as trait anxiety. In the current study we sought to better understand the relationship between trait anxiety and affective differentiation. We did so using an emotion modulation task made up of a series of clips previously validated to induce specific emotions. These clips were presented in a sequence designed to maximize the potential for the detection of emotional shifts and to provide an opportunity for variability in affective reporting. Ratings of participants’ feelings following each clip were made utilizing affect terms consistent with dominant models of affect (Rafaeli, Rogers, & Revelle, 2007; Russell, 1980). This emotion modulation task and rating system provides a lab-based approximation of differentiation by sampling a given individuals’ experience both across time and contexts, and by placing focus on participants rating their own feelings rather than the content of the video.
Given the evidence that individuals with high trait anxiety seem to sacrifice elaborative or higher order processing of experience, we hypothesized that those high in trait anxiety would have greater difficulty differentiating their affective experiences during the emotion modulation task than those low in trait anxiety. Further, we hypothesized this relationship would hold true for negative but not positive affect differentiation, as negative emotions are often the focus of those who are trait anxious (Bieling et al., 1998). Finally, we examined the previously established link between negative affect differentiation and symptoms of depression (Erbas et al., 2014; Demiralp et al., 2012). Given the overlap between trait anxiety and features of depression, we were also interested in understanding whether trait anxiety would predict additional variance in negative affect differentiation beyond that accounted for by depressive symptoms.
Method

Participants

Two hundred and twenty-two individuals (146 women, 76 men, $M_{age} = 21.2$ years, age range: 18-56 years) from a large public university and the surrounding community participated in this study. The racial and ethnic composition of the sample was 79.7% Caucasian, 11.7% African American, 1.8% Asian American, 6.8% Other, and 6.3% Hispanic or Latino. Participants were included if they were over the age of 18, fluent in English, and possessed normal or corrected-to-normal hearing and color vision. Participants were given the option to receive partial course credit or compensation of $10 per hour of participation. Of the total sample, twenty-one participants (9.5%) received compensation. Participants were pooled from two co-occurring studies with identical procedures. Independent samples t-tests revealed some group differences in age ($t = 1.98, p = .049$) and undergraduate status ($t = 4.98, p < .001$). These variables were controlled for in later analyses.

Measures

Current Depression. Participants completed the Center for Epidemiologic Studies Depression Scale (CES-D, $M = 11.07$, $SD = 7.39$, $\alpha = .85$) (Radloff, 1977, $\alpha = .80$). The CES-D is a widely used measure of current depressive symptomatology in the general population. The CES-D is made up of 20 items each scored on a 0 to 3 scale of
frequency, with a 0 indicating ‘Rarely or None of the Time (Less than 1 Day)’ and a 3 indicating ‘Most or All of the Time (5-7 Days)’.

**Trait Anxiety.** The State-Trait Anxiety Inventory Form Y (STAI, $M = 37.05$, $SD = 9.35$, $\alpha = .91$) is a well-validated self-report measure of both current and dispositional anxiety (Spielberger, Gorsuch, Lushene, 1970, $\alpha = .89$). The STAI is made up of 40 items (20 for assessing state anxiety, 20 for assessing trait anxiety) that can each be responded to on a 4-point frequency scale ranging from “Almost Never” to “Almost Always”. The current study used only the Trait Anxiety subscale, in order to assess how participants ‘generally’ feel.

**Affect Ratings.** Participants rated how they were currently feeling using 12 emotion words (Fear, Relief, Sadness, Enjoyment, Distress, Guilt, Happiness, Anger, Amusement, Disgust, Affection) using a Likert-type scale (0 = ‘None’ to 7 = ‘Strongly’). Ratings were made a total of six times, once before the clips began and then again following each video in the sequence (for average ratings see Table 1). The words used were drawn from contemporary models of affect (Rafaeli, Rogers, & Revelle, 2007; Russell, J, 1980) and have been used previously (Coifman & Bonanno, 2010; Coifman, Bonnano, & Rafaeli, 2007; Coifman, et al, 2013). Six words made up the negative affect terms: fear, sadness, distress, guilt, and anger ($\alpha = .87$). Five words made up the positive affect terms: relief, enjoyment, happiness, amusement, and affection ($\alpha = .82$).
Table 1. Average negative and positive affect ratings of videos presented during the emotion modulation task (N = 222)

<table>
<thead>
<tr>
<th>Video</th>
<th>Negative Affect</th>
<th>Positive Affect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Video 2: Road to Guantanamo</td>
<td>3.46</td>
<td>1.52</td>
</tr>
<tr>
<td>Video 3: Alive</td>
<td>1.23</td>
<td>0.38</td>
</tr>
<tr>
<td>Video 4: The Champ</td>
<td>2.33</td>
<td>0.92</td>
</tr>
<tr>
<td>Video 5: Between Two Ferns</td>
<td>1.16</td>
<td>0.41</td>
</tr>
</tbody>
</table>

**Emotion Modulation Task.** Participants completed an emotion modulation task in which they were asked to engage emotionally with a series of well-validated video clips (Shaheen, Halachoff, Flynn & Coifman, 2014). Six five-minute video clips were presented in a set order with a two-minute interval between each, reserved for participants to complete affect ratings. Participants began by watching a neutral baseline video (Big Cat Diaries, BBC Earth) followed by a four-video sequence that alternated activation and valence i.e. high activation, negative valence (The Road to Guantanamo; Revolution, 2006); low activation, positive valence (Alive; Paramount Pictures, 1993); low activation, negative valence (The Champ; Metro Goldwyn Mayer, 1979); and high activation, positive valence (Between Two Ferns; www.comedyordie.com, 2010). This sequence was designed in order to maximize the potential for the detection of emotional shifts and to provide an opportunity for variability in affective reporting. The task was programmed in *E-prime* 2.0. A manipulation check of this sequence was conducted using repeated measures ANOVA (video X affect) and revealed that the overall pattern of responses was as predicted (e.g., increases and decreases in negative and positive affect were consistent with the pattern of videos and evident in an affect X video interaction:}
\( F(3, 217) = 19.24, p < .000 \). Following the four-video sequence, participants watched 3 minutes of humorous video (Funny Cats, www.youtube.com) to restore positive mood.

**Procedure**

The Institutional Review Board (IRB) of Kent State University approved the following study protocol. Research activities were conducted at Kent State University in Kent, OH. All participants provided informed written consent prior to enrollment. Upon arrival at the lab each participant completed demographic information and measures of current depression and trait anxiety, followed by an emotion modulation task during which they were asked to rate their affective experience at several time points. All measures and tasks were administered by rigorously trained undergraduate and graduate research assistants.

**Preliminary statistical analyses**

*Affect Differentiation*

Consistent with prior research affective differentiation was derived by calculating within-person average interitem correlations (AICs) between all possible pairs of negative (\( M = -0.17, SD = 0.61 \)) or positive (\( M = 0.30, SD = 0.47 \)) emotion items across the aforementioned four-video sequence by participant (Barrett et al., 2001; Kashdan et al., 2010; Pond et al., 2012; Tugade et al., 2004). The AICs were then normalized using Fisher-to-z transformations and reversed in order to aid in interpretation, with large
values corresponding to high affect differentiation and small values to low affect
differentiation (Kashdan et al., 2010).
Results

Initial Pearson correlations were calculated between all study variables (see Table 2). In line with prior research, trait anxiety correlated positively with depression symptoms (Bieling et al., 1998). In line with our hypotheses, trait anxiety also correlated negatively with negative affect differentiation. No significant relationship emerged between depression symptoms and negative affect differentiation. Additionally, negative and positive affect differentiation correlated positively with one another.

Table 2. Correlations between self-reported trait anxiety and depression symptoms and negative and positive affect differentiation (N = 222)

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tr>
<td>1. Trait Anxiety (STAI)</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Depression Symptoms (CESD)</td>
<td>.75**</td>
<td>--</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Negative Affect Differentiation</td>
<td>-.17*</td>
<td>-.07</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>4. Positive Affect Differentiation</td>
<td>.09</td>
<td>.06</td>
<td>.22**</td>
<td>--</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01

Ordinary least squares regression analyses were conducted to examine whether trait anxiety predicted negative affect differentiation (Table 3). In Step 1 we entered the control variables: age, gender, and undergraduate status. In Step 2 we entered depression symptoms. Finally, in Step 3 we entered trait anxiety. Consistent with our hypotheses,
high trait anxiety predicted lower levels of negative affect differentiation ($\beta = -0.24, p = 0.02$) and its addition significantly improved model fit, $R^2 = .06, F(5, 216) = 5.49, p = 0.02$.

Contrary to prior work, no significant relationship was found between negative affect differentiation and symptoms of depression.
Table 3. Ordinary least squares regression examining the relationship between negative affect differentiation and positive affect differentiation with trait anxiety after controlling for age, gender, undergraduate status, and current symptoms of depression (N = 222)

<table>
<thead>
<tr>
<th>Negative Affect Differentiation</th>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>sr²</th>
<th>R²</th>
<th>ΔR²</th>
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</thead>
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<td>Step 1</td>
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<td>0.03</td>
<td></td>
<td></td>
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<td>*F(3, 218) = 2.29, p=.08</td>
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<td></td>
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<tr>
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<td>Undergraduate Status</td>
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<td>-0.11</td>
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<td>Depression</td>
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<td>-0.01</td>
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<tr>
<td>Trait Anxiety</td>
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<td>0.10</td>
<td>0.00</td>
<td></td>
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<tr>
<td>F(5, 216) = 0.87, ns</td>
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*p <.05
The same ordinary least squares regression analyses were conducted to examine whether trait anxiety predicted positive affect differentiation (Table 3). Consistent with our hypotheses, high trait anxiety did not significantly predict positive affect differentiation. Additionally, no significant relationship emerged between positive affect differentiation and symptoms of depression.

Additional ordinary least squares regression analyses were conducted to examine whether the interaction between mean negative affect (NA) and depression or between mean NA and anxiety predicted negative affect differentiation. There was a significant interaction between mean NA and depression in the prediction of negative affect differentiation ($\beta = -0.33, p = .001$). Among individuals with lower levels of depression, mean NA predicted high negative affect differentiation ($t = 2.65, p = .01$). Among individuals with higher levels of depression, mean NA predicted less negative affect differentiation ($t = -13.8, p < .001$).

There was also a significant interaction between mean NA and trait anxiety in the prediction of negative affect differentiation ($\beta = 0.21, p = .01$). Among individuals with lower levels of trait anxiety, mean NA predicted less negative affect differentiation ($t = -3.07, p = .00$). However, among individuals with higher levels of trait anxiety, mean NA did not significantly predict less negative affect differentiation ($t = 1.70, p = .53$).
Discussion

In this study, we examined the relationship between trait anxiety and affect differentiation. To our knowledge, this is the first study to examine the construct of differentiation as it relates to broader dispositional anxiety. The current findings demonstrate that higher trait anxiety predicts lower levels of negative affect differentiation. These results expand on theoretical work that suggests that those who are trait anxious fail to semantically elaborate their feelings (Brewin, 2001), and empirical work that indicates these individuals have higher self-reported alexythymia (Marchesi et al., 2000).

Furthermore, this relationship remained significant after controlling for variable differences between samples, gender, and symptoms of depression. Prior work by Demiralp et al. (2012) and Erbas et al. (2014) has shown that those with both clinical and symptom-level depression report less differentiated negative affect as compared to controls. We also know, however, that depression and anxiety frequently co-occur and that measures used to assess symptoms of both disorders often share overlapping features (Santorius, Ustin, Lecrubier, & Wittchen, 1996; Bieling, Antony, & Swinson, 1998; Bados, Gomez-Benito, & Balaguer, 2010). Our results suggest that trait anxiety may be an additional factor relevant to the link between depression and differentiation, and that further exploration is warranted.
Our findings are of particular interest when considering recent research on the potential mechanisms that underlie the benefits of affect labeling. Work by Hariri (2000) and others (Lieberman et al., 2007; Kircanski et al., 2012; Tabibnia et al. 2008) suggest that labeling may serve an implicit regulatory function through downregulation of the amygdala by the prefrontal cortex, leading to a reduction in physiological arousal. A lack of affect differentiation in trait anxious individuals suggests that they have deficits in affect labeling, and will therefore not benefit from the regulatory function of doing so.

Additional work by Kross and Ayduk (2011) hypothesizes that the reduction in arousal that occurs with labeling may allow for the ‘space’ to more efficiently process events during an emotional experience. The ‘space’ comes from processing content from a self-distanced perspective, in which an individual considers their situation or feelings in the eyes of a distanced observer who can attempt to reason though the emotions independent of feeling them. Taking a self-distanced perspective is thought to allow for a broader focus and for reconstrual of experiences, which may facilitate distress reduction. It follows that those who are trait anxious, and therefore less effective at affect differentiation and labeling, may lack the ‘space’ to process their emotional experiences effectively. This lack of space may contribute to the maintenance of anxious hypervigilance, and in turn perhaps lead to the development of psychopathology. Future work should seek to test the relationship between these variables.

In line with our hypothesis, we also found that neither trait anxiety nor depression symptoms predicted positive affect differentiation. These findings may be best understood by considering that negative affective experiences are often the focus of those
with symptoms of psychopathology. Attempts to manage these experiences rely on emotion regulation, a skill we know to be supported by affect differentiation (Barrett et al., 2001). While individuals are known to regulate both positive and negative emotions, regulatory strategies are used most in processing experiences of negative affect (Parrott, 1993; Barrett et al., 2001). This is due in part to the information conveyed by negative affective states, which often signals the need for immediate change (Pratto & John, 1991). Failure to respond to positive signals is therefore less pressing, as it may perhaps only result in a less significant long-term cost (Fredrickson, 2004).

Interestingly, in contrast with prior findings (Demiralp et al., 2012; Erbas et al., 2014), no significant relationship emerged between higher levels of depression symptoms and lower negative affect differentiation. These findings may be due in part to our use of a college sample whose range of depression scores was restricted in comparison to other studies where this relationship has been found (Erbas et al., 2014). Another explanation for these findings may lie in the previously mentioned shared negative affect component of both depression and trait anxiety (Santorius, Ustin, Lecrubier, & Wittchen, 1996; Bieling, Antony, & Swinson, 1998; Bados, Gomez-Benito, & Balaguer, 2010). This overlap is in line with recent research that suggests a common underlying factor (e.g. p factor, trait neuroticism) of psychopathology (Caspi et al., 2014; Barlow, Sauer-Zavala, Carl, Bullis, & Ellard, 2014). To our knowledge, neither Demiralp et al. (2012) nor Erbas et al. (2014) controlled for trait anxiety when examining the relationship between depression and differentiation. Therefore, it may be possible that trait anxiety is part of
the underlying factor in these significant relationships. Further examination of this potential relationship in a clinical sample is currently underway.

Our study has several notable limitations. Most important was our choice to use an in-lab emotion modulatory task rather than experience sampling. Experience sampling would allow for the collection of more ratings of emotion across a longer period of time and perhaps across a larger variety of contexts. Our results, therefore, may reflect participants’ particular responses to select affective content rather than their own day-to-day experiences. Our task, however, had a number of notable strengths. First, this method was cost-effective as it was able to be conducted in one visit to the lab. Second, the videos selected were shown to be effective at eliciting the desired affective responses in previous research (Gross & Levenson, 1995; Shaheen, Halachoff, Flynn & Coifman, 2014). Another limitation was our previously mentioned use of a college sample. Doing so lead to a relatively restricted range of self-reported symptoms and may limit the generalizability of our results to the current population. Replication of these findings in additional college samples as well as in clinical populations would lend additional support to our current results.

Our current findings contribute to the overall understanding of affect differentiation in a number of ways. They first suggest that the ability to differentiate negative affective experiences may be related to the broad dispositional construct of trait anxiety rather than limited to specific disorders alone. This finding also has important clinical implications. While emotion labeling is a feature of treatment modalities such as cognitive behavioral therapy and dialectical behavioral therapy, our results suggest that
deficits in emotion language and affect differentiation be considered independent of treatment modality and disorder. This approach is in line with recent dimensional approaches to pathology that seek to identify factors that may cut across established diagnostic categories (Cuthbert, 2014). Further, fostering differentiation abilities in those with subthreshold psychopathology may perhaps serve as a protective mechanism, providing individuals with a tool to process emotional content from the aforementioned self-distanced perspective (Kross & Ayduk, 2011). Additionally, our results suggest that trait anxiety may play a role in the previously demonstrated relationship between differentiation and depression. Identification of the common factors that contribute to these relationships may allow for a better understanding of what leads to both high and low differentiation abilities. Finally, our research suggests our emotion modulation task may be an effective way to assess differentiation in a laboratory setting, and serve as a potential low-cost alternative to experience sampling while still assessing emotions over time.
References


differences in mixed emotions. *Personality & Social Psychology Bulletin, 33*(7),

915–32. doi:10.1177/0146167207301009


reactivity differentially predict concurrent and prospective functioning in major


http://psycnet.apa.orgjournals/emo/2/2/135

Rudaizky, D., Basanovic, J., & MacLeod, C. (2014). Biased attentional engagement with,

and disengagement from, negative information: independent cognitive pathways to


doi:10.1080/02699931.2013.815154


Psychology, 39*(6), 1161–1178. doi:10.1037/h0077714


comorbid with anxiety: Results from the WHO study on “Psychological disorders in


Schwarz, N. (1990). Feelings as information: Informational and motivational functions

of affective states. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of*
motivation and cognition: Foundations of social behavior (pp. 527–561). New
York, NY: Guilford Press.

Informative and directive functions of affective states. Journal of Personality and
Social Psychology, 45, 513–523. Retrieved from

affective states. In K. Fiedler & J. Forgas (Eds.), Affect, cognition, and social
behavior (pp. 44–62). Toronto: Hogrefe.

Shaheen, R., Halachoff, D., Flynn, J. & Coifman, K.G. (2014). A Film Set for the
Elicitation of Emotion in Research; An Integrative Catalog Derived from Four
Decades of Investigation. Manuscript under review.


Anxiety Inventory. Palo Alto, CA: Consulting Psychologists Press. Retrieved from
http://ubir.buffalo.edu/xmlui/handle/10477/2895

feelings: words may facilitate exposure effects to threatening images. Emotion

Emotion Dysregulation in Generalized Anxiety Disorder: A Comparison with Social


