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Are emotional clarity and emotion differentiation related?

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Distinct literatures have developed regarding the constructs of emotional clarity (people's meta-knowledge of their affective experience) and emotion differentiation (people's ability to differentiate affective experience into discrete categories, e.g., anger vs. fear). Conceptually, emotion differentiation processes might be expected to contribute to increased emotional clarity. However, the relation between emotional clarity and emotion differentiation has not been directly investigated. In two studies with independent, undergraduate student samples, we measured emotional clarity using a self-report measure and derived emotion differentiation scores from scenario-based (Study 1) and event-sampling-based (Study 2) measures of affect. We found that emotional clarity and emotion differentiation are: (i) associated to a very small and statistically insignificant degree; and (ii) differentially associated with trait and scenario-based/event-sampling-based measures of affect intensity and variability. These results suggest that emotional clarity and differentiation are distinct constructs with unique relations to various facets of affective experience.

Keywords: Emotional clarity; Emotion differentiation; Emotion granularity; Emotional awareness.

People's knowledge of their own experience of affect (e.g., mood, emotion) has been broadly linked to well-being (e.g., Palmer, Donaldson, & Stough, 2002; Tugade, Fredrickson, & Barrett, 2004) and mental disorders (e.g., Berenbaum et al., 2006; Berenbaum, Bredemeier, Thompson, & Boden, 2012; Boden, Bonn-Miller, Kashdan, Alvarez, & Gross, 2012; Kashdan, Ferssizidis, Collins, & Muraven, 2010; Pond et al., 2012; also see Berenbaum, Raghavan, Le, Vernon, & Gomez, 2003). Theorists and researchers posit that these associations are attributable to the influence of this knowledge on emotion regulation. Specifically, effective emotion regulation is largely dependent upon knowledge of experienced emotions that are targeted for regulation (Barrett & Gross,

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2001), as this understanding provides information that facilitates the choosing and implementation of a strategy that has the best chance of regulating emotions consistent with one's goals. Two somewhat distinct literatures, on emotional clarity and emotion differentiation (also known as emotion granularity), propose to investigate people's knowledge of their own affective experiences. As the following quotations illustrate, at least some researchers appear to describe emotional clarity and emotion differentiation in remarkably similar ways: "*Clarity* . . . indexes perceived ability to understand and discriminate between different moods and emotions, or the 'clarity' of feelings" (Palmer et al., 2002, pp. 1093–1094), and "We propose that emotion differentiation improves coping and allows for greater regulatory control over one's emotional state, due to an enhanced capacity for understanding, clarifying, and describing what one feels at any point in time" (Pond et al., 2012, p. 326).

Surprisingly, no published studies have explored links between emotional clarity and emotion differentiation. Because it is unclear whether typical measures of emotional clarity and emotion differentiation are assessing distinct or overlapping constructs, it is difficult to compare and contrast the growing body of research on these constructs, all of which purports to assess people's knowledge of their own affective experiences (e.g., Barrett, Gross, Christensen, & Benvenuto, 2001; Berenbaum et al., 2006, 2012; Boden et al., 2012; Kashdan et al., 2010; Pond et al., 2012; Tugade et al., 2004). The goal of the present research was to investigate the relation between emotional clarity and emotion differentiation and to examine whether they demonstrate unique relations to two other aspects of affective experience, affect intensity and affect variability.

Despite some researchers using these terms emotional clarity and emotion differentiation interchangeably, the way they are conceptualised and measured suggest that they differ in their emphasis. Emotional clarity is typically conceptualised as meta-emotional knowledge of one's own affective experiences. Higher emotional clarity results in a greater ability to identify, discriminate between and understand the type (e.g., anger vs. frustration) and source of affect one typically experiences (Boden & Berenbaum, 2011; Coffey, Berenbaum, & Kerns, 2003; Gohm & Clore, 2000, 2002). It is a dimensional, individual difference construct that may be more highly related to the experience of affect, broadly, including all facets (e.g., physiological arousal, subjective experience) and classes (e.g., moods, emotions), as described below. Emotional clarity is relatively distinct from dimensions representing the extent to which emotions are attended to and emotional expression (Coffey et al., 2003; Gohm & Clore, 2000).

The construct of emotional clarity can be traced to literatures that describe emotional clarity as a core dimension of alexithymia (see Taylor, 2004) and emotional intelligence (Gardner, 1983; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). These two literatures have been integrated in studies on emotional/mood awareness and affect-as-information theory (e.g., Coffey et al., 2003; Gohm & Clore, 2000, 2002). As emotional clarity is a dimension underlying alexithymia and emotional intelligence, emotional clarity is most often assessed by self-report questionnaires that measure alexithymia and emotional intelligence, such as the Bermon–Vorst Alexithymia Questionnaire (Vorst & Bermond, 2001), Toronto Alexithymia Scale (Bagby, Parker & Taylor, 1994), and Trait Meta-Mood Scale (Salovey et al., 1995). Combinations of measures are often used in this regard (Coffey et al., 2003; Gohm & Clore, 2000; Palmieri, Boden, & Berenbaum, 2009). Far less frequently, emotional clarity is assessed by structured interviews (Bagby, Taylor, Parker, & Dickens, 2006) or response-time measures (i.e., the speed at which one can identify the type of emotion experienced in the moment; Lischetzke, Angelova, & Eid, 2011; Lischetzke, Cuccodoro, Gauger, Todeschini, & Eid, 2005).

Emotion differentiation refers to the level of complexity with which individuals identify, label, and represent their discrete affective *experiences* (Lischetzke et al., 2005) and is conceptualised as an ability or skill (Barrett et al., 2001). Regardless of the frequency and intensity with which they

experience affect (i) individuals low in emotion differentiation tend to identify, label, and represent discrete affective experiences in more global terms (e.g., on a continuum ranging from "good" to "bad"), and (ii) individuals high in emotion differentiation tend to make subtle distinctions among their affective experiences, and use specific terms to label and represent these experiences (e.g., anger, frustration, annoyance). Similar to emotional clarity, emotion differentiation is an individual differences construct, as the complexity with which people identify, label, and represent emotional experiences into discrete emotional categories varies continuously (Barrett, 1998, 2004; Feldman, 1995). Furthermore, as described below, emotion differentiation may be highly related to the subjective experience of affect, specifically, rather than other facets of affective experience.

Because emotion differentiation is considered by theorists and researchers to be an ability or skill, studies of emotion differentiation include performance-based or indirect measures (e.g., Barrett et al., 2001; Kashdan et al., 2010; Lane, Quinlan, Schwarts, Walker, & Zeitlin, 1990; Pond et al., 2012; Tugade et al., 2004). A growing body of research has circumvented problems inherent with performance-based measures of emotion differentiation[1] by using an indirect measure of emotion differentiation. This measure is derived from multiple administrations of any measure assessing current affective *experience* (Barrett et al., 2001; Demiralp et al., 2012; Kashdan et al., 2010; Pond et al., 2012; Tugade et al., 2004). Typically, measures are administered multiple times over a given time period, such as through the use of experience sampling methods. Thus, a range of affective experiences, occurring in varying contexts and with varying causes, is sampled. Emotion differentiation is obtained by calculating the average inter-correlation between emotion words across administrations, with separate indices for positive (e.g., happy, content, peaceful) and negative emotion words (e.g., sad, guilty, ashamed). Smaller associations between words (either positive or negative) indicate greater distinction between affect categories, and thus higher emotion differentiation.

Although theoretically and conceptually overlapping, no published studies have investigated whether emotional clarity and emotion differentiation are associated. Regardless of their theoretical and conceptual relations, emotional clarity and emotion differentiation may not be highly related for at least three reasons. First, emotional clarity does not refer exclusively to subjective experience, but can include knowledge based on other facets of affect. Affect is typically defined as multifaceted, whole-body responses involving loosely integrated changes in subjective experience (i.e., feeling), behaviour and central and peripheral physiology (Clore, Gasper, & Garvin, 2001; Gross & Thompson, 2007; Mauss, Levenson, McCarter, Wilhelm, & Gross, 2005) to situations that are appraised as significant to the needs, goals, and concerns of an individual (Frijda, 1986; Scherer, 1999). Affect is commonly distinguished into classes, such as mood and emotion (see Clore, Schwarz, & Conway, 1994; Davidson et al., 1994; Russell, 2003). Whereas emotional clarity may be relevant to all facets of affect, emotion differentiation is particularly relevant to the felt, subjective experience of affect, which is distinguished into different types (e.g., fear, anger) when engaging in emotion differentiation processes. Additionally, emotional clarity can refer to affect that may extend over a longer period of time (e.g., affect over the course of an hour during which one

[1] The LEAS (Lane et al., 1990), a performance-based measure of emotion differentiation, requires all participants to provide answers to a common set of questions for which the correct answer is the same for all individuals and judged by a third party. The LEAS might adequately measure one's understanding of other people's emotions (i.e., affect recognition) since there will likely be a high degree of consensus regarding the "correct" answer. However, the LEAS is not an adequate way to assess emotion differentiation or one's understanding of one's own emotions more broadly because the validity of an observer's inferences regarding another's emotions will necessarily be limited. For example, different individuals respond to the same event with different emotions. Therefore, we have chosen not to include the LEAS in the current research.

engaged in an argument with a romantic partner), whereas emotion differentiation concerns phenomena that occurs during a much narrower time frame (i.e., experience at a single discrete point in time). Therefore, emotion differentiation is conceptualised and measured more narrowly than is emotional clarity. A second reason that emotional clarity and emotion differentiation may not be related is that on-line reports of affect, such as those traditionally used to measure emotion differentiation, rely on different types of information and knowledge than do trait, self-reports of affect that are retrospective, such as those traditionally used to measure emotional clarity (see Robinson & Clore, 2002, for a comprehensive discussion of on-line vs. retrospective reports).

A third reason why emotional clarity and emotion differentiation may not be highly related is that they may represent unique aspects of affective knowledge, above and beyond the extent to which they differentially represent affective experiences. As meta-emotional knowledge of one's affect, emotional clarity may be determined through reflection on processes, including but not limited to emotion differentiation, and be influenced by non-emotional factors (e.g., identity-related beliefs; Robinson & Clore, 2002). Thus, self-report measures of emotional clarity may assess the content of people's knowledge of their experience of affect. Alternatively, measures of emotion differentiation may assess people's ability to use that knowledge to make sense of their affective *experiences*, which may sometimes be emotions or moods, at discrete moments in time (see Lindquist & Barrett, 2008).

Based on these three reasons, we hypothesised that emotional clarity and emotion differentiation would be associated positively to a small degree. To the extent that emotional clarity and emotion differentiation represent unique aspects of affective knowledge, or measures of these constructs are based on different types of information and knowledge and/or differently assess facets of affective experience over different time frames, the discrepancies commonly found between trait and online measures of similar emotional constructs (Mauss & Robinson, 2009) may be mirrored by moderate-to-small associations between typical measures of trait emotional clarity and emotion differentiation. Therefore, emotional clarity might be expected to be more highly associated with trait measures of affective processes, such as self-reported measures of trait affect intensity and affect variability. In contrast, emotion differentiation might be expected to be more highly associated with other on-line measures of affective processes, such as on-line measures of affect intensity and variability.

In addition to examining the association between emotional clarity and emotion differentiation, we examined whether they demonstrate unique relations to affect intensity and variability. Knowledge regarding the source and type of emotions is considered vital to using emotion information to effectively regulate emotions (Barrett & Gross, 2001). Consequently, lower levels of emotional clarity or emotion differentiation should contribute to less effective emotion regulation, which may in turn result in dysregulated affect, manifested as elevated levels of affect intensity and variability. Indeed, previous research has demonstrated that affect variability, and to a lesser extent affect intensity, are both inversely related to emotional clarity (Thompson, Disén, & Berenbaum, 2009) and differentiation (Demiralp et al., 2012; Kashdan et al., 2010; Pond et al., 2012). Based on our expectation that emotional clarity would be more highly associated with trait measures of affect variability/intensity, and that emotion differentiation would be more highly associated with other on-line measures of affect variability/intensity, we expected the strongest relations between emotional clarity and a trait measure of affect variability and between emotion differentiation and an event-sampling-based measure of affect variability. This is because we hypothesise that emotion differentiation, which is measured in the moment, is associated with affective experience in the moment, and hence, with the actual variability of moment-by-moment emotional experience. In contrast, we hypothesise that emotional clarity, which is a measure of meta-emotional knowledge of one's affect, is associated with one's global understanding of one's affect variability.

One's global understanding of affect variability is influenced not only by actual moment-by-moment affect variability, but also by the personal salience of such variability and the significance one attaches to such variability. Therefore, emotional clarity would be associated with retrospectively reported trait measures of affect variability.

To summarise, emotional clarity is conceptualised as a psychological trait representing meta-emotional knowledge of one's own affect, including the source and type of affect one typically experiences. Emotional clarity is typically measured by retrospective, self-reports, which may assess the experience of affect, broadly, over indefinite time frames. Emotion differentiation is conceptualised as an ability or skill with which individuals identify, label, and represent their discrete affective experiences (Barrett et al., 2001; Lischetzke et al., 2005). Emotion differentiation is typically measured by on-line reports of discrete affective experience, which likely assess the subjective experience of affect.

The primary goal of the present research was to examine the relation between emotional clarity and emotion differentiation. As an additional means of investigating similarities between emotional clarity and emotion differentiation, we also examined whether they demonstrate unique relations to affect intensity and affect variability. We examined these issues in two independent samples. We derived positive and negative emotion differentiation scores from a scenario-based emotional assessment in Study 1 and from a more commonly used experience sampling protocol in Study 2. Similar results across studies would signify that our results were robust to measurement technique, while providing preliminary data on a new method for assessing emotion differentiation. We assessed emotional clarity, affect intensity and variability using self-report measures. We additionally assessed affect intensity and variability using scenario-based/event-sampling-based measures. Consequently, we were able to investigate whether emotional clarity and emotion differentiation were associated to a similar degree with trait and scenario/experience sampling-based measures of affect intensity and variability.

STUDY 1

In Study 1, emotional clarity, affect intensity, and affect variability were assessed with widely used self-report measures. A second measure of affect intensity, as well as a measure of emotion differentiation, was computed from participant ratings of mood in response to scenarios depicting common life events (Schimmack & Diener, 1997). A scenario-based task is advantageous because it standardises the situations in which affect is experienced and does not require the use of effort- and time-intensive methods, such as experience sampling. Past research has demonstrated a strong relation between affect intensity as measured by a scenario-based task and experience sampling methods (Schimmack & Diener, 1997), providing support for the use of a scenario-based task to assess emotional constructs.

Methods

Participants and procedures

Two hundred ten undergraduate students (57.9% female; $M_{age} = 19.4$ years, $SD = 2.3$, $Range = 16$–33 years) from a large Midwestern university completed the measures described below. Participants were recruited to take part in a project examining cognitive correlates of emotional traits (see Dizén & Berenbaum, 2011). Of those participants who reported their ethnicity/race, most reported being White/Caucasian (69.0%), followed by Asian American (13.8%), African American (7.6%), various other ethnicities (5.5%), and Latino (4.1%). Participants can be considered a random sample of students enrolled in psychology classes, as they were unaware of the nature of the study at the time of assignment to this particular study. Participants completed questionnaires in small groups (10 or fewer) and received course credit for their participation. The study protocol was approved by the Institutional Review Board at the University of Illinois at Urbana-Champaign.

Participants were drawn from a larger sample recruited to participate in the research described in Study 1 of Dizén and Berenbaum (2011).

Participants were deemed eligible for the current study if they completed measures of both emotional clarity and emotion differentiation and did not complete experience sampling procedures described in Study 2. Participants included in the current study did not differ from those not included ($n = 201$) in terms of age, gender, emotional clarity, trait affect intensity, or trait affect variability ($ps > .08$).

Measures

Emotional clarity. Emotional clarity was measured using the clarity subscale of the Trait Meta-Mood Scale (TMMS; Salovey et al., 1995). The clarity subscale includes 11 items (e.g., "I usually know my feelings about a matter", "I am usually clear about my feelings") that participants rate using a 5-point Likert scale (1 = *Strongly disagree*; 5 = *Strongly agree*). Items were scored so that higher scores represented greater emotional clarity. The emotional clarity subscale has been found to have excellent psychometric properties and reasonable evidence of convergent and discriminant validity (Coffey et al., 2003; Gohm & Clore, 2000, 2002; Salovey et al., 1995). Internal reliability (i.e., Cronbach's α) in the current sample was .87. See Table 1 for descriptive statistics for all measures included in Study 1.

Emotion differentiation. Emotion differentiation was measured by the emotional reactions of the participants in response to scenarios depicting common life events, using a Scenario Rating Task (SRT; Schimmack & Diener, 1997), modified for use in a recent study by Disén and Berenbaum (2011). Participants read 20 descriptions of emotion-eliciting situations (10 positive, 10 negative). For each situation, participants rated how they would feel (i.e., ashamed, angry, worried, sad, jealous, guilty, happy, proud, joyful, love, excited, satisfied) on a 6-point Likert scale (0 = *Not at all*; 6 = *Extremely*). Instructions taken from Schimmack and Diener (1997) emphasised the importance of zero (i.e., absence of an emotion) and non-zero ratings (i.e., presence of an emotion at varying degrees). Consistent with previous research (Barrett, 1998; Kashdan et al., 2010; Pond et al., 2012; Tugade et al., 2004), indices of positive and negative differentiation were separately formed by calculating the average intraclass correlations with absolute agreement between negative and positive emotion words, respectively, for each participant across the 20 emotion eliciting situations. We transformed intraclass correlation coefficients using a Fisher Z' transformation. To facilitate interpretation we subtracted resulting scores from 1 so that higher scores represented greater differentiation. The mean, standard deviation, and range of transformed intraclass correlation coefficients indicated an acceptable level of variation captured by this task (see Table 1).[2]

Affect intensity. Affect intensity was measured in two ways. First, we measured the intensity of affect reported in response to each of the 20 scenarios included in the SRT described above. To do this, we used the methods suggested by Schimmack and Diener (1997), by which mean affect scores for each discrete affect were decomposed into intensity and frequency components—i.e., mean affect = affect frequency (number of non-zero ratings) × affect intensity (average across all non-zero ratings)/number of ratings). We averaged across discrete positive affect intensity scores (Cronbach's $\alpha = .91$) and discrete negative affect intensity scores (Cronbach's $\alpha = .87$), respectively, to obtain positive and negative affect intensity composite scores. Similar to previous research (Schimmack & Diener, 1997), positive and negative affect intensity scores were highly positively correlated ($r = .72$, $p < .01$). We therefore calculated a global affect intensity score by summing positive and negative affect intensity scores.

Second, trait levels of affect intensity were measured using the Affect Intensity Measure (AIM; Larsen, Diener, & Emmons, 1986).

[2] One participant received a negative intraclass correlation coefficient, indicating measurement error. Based on recommendations of Cohen, Cohen, West, and Aiken (2003), we changed this score to zero and proceeded with analyses. Results were near identical to those reported below when removing this participant from further analyses.

Table 1. *Descriptive statistics and zero-order correlation coefficients for Study 1*

	1	*2*	*3*	*4*	*5*	*6*
1. Clarity	—					
2. Positive differentiation	−.01	—				
3. Negative differentiation	.12	.46**	—			
4. SRT intensity	.05	−.36**	−.33**	—		
5. Trait intensity	−.04	−.24**	−.22**	.34**	—	
6. Trait variability	−.42**	−.08	−.22**	.17*	.39*	—
Mean	3.31	−0.67	−.06	6.21	3.64	12.64
Standard Deviation	0.65	0.39	0.35	1.43	0.48	2.96
Range	1.55–5.00	−1.65–1.00	−1.30–0.95	2.90–10.74	2.40–5.53	6.55–21.35

Notes: Intensity = affect intensity; Variability = affect variability; SRT = scenario-response task. **$p < .01$; *$p < .05$.

Participants responded to 40-items (e.g., "My emotions tend to be more intense than those of most people") using a 6-point Likert scale (1 = *Never*; 6 = *Always*). The AIM has been shown to have good internal consistency, test–retest reliability, and good discriminant validity (Larsen et al., 1986). Internal reliability (i.e., Cronbach's α) in the current sample was .89.

Affect variability. Trait levels of affect variability were measured using the Affective Lability Scale (ALS; Harvey, Greenberg, & Serper, 1989). The ALS includes 54-items (e.g., "One minute I can be feeling OK and the next minute I'm tense, jittery and nervous", "It's very common for me to be extremely angry about something and then to suddenly feel like my normal self") that participants respond to using a 4-point Likert scale (1 = *Very characteristic of me, extremely descriptive*; 4 = *Very uncharacteristic of me, extremely undescriptive*). Higher scores represent higher levels of affect variability. The ALS has been shown to have good internal consistency and suitable test–retest reliability (Harvey et al., 1989). Internal reliability (i.e., Cronbach's α) in the current sample was .95.

Results and discussion

We began by investigating the association between emotional clarity and emotion differentiation by calculating zero-order correlations. As shown in Table 1, zero-order correlations revealed small and insignificant correlations between emotional clarity and (i) positive emotion differentiation and (ii) negative emotion differentiation. Positive and negative emotion differentiation were moderately, positively correlated. Emotional clarity was inversely, moderately associated with trait affect variability, but not associated with trait or SRT-based affect intensity. Positive and negative emotion differentiation both were inversely, moderately associated with both trait and SRT-based affect intensity, and negative emotion differentiation was inversely, moderately associated with trait affect variability.

We conducted two sets of comparisons of the absolute strength of correlation coefficients (two-tailed) using Fisher Z' transformations. In the first set, we compared the associations between emotional clarity and emotion differentiation (positive/negative) to the association between trait and SRT-based affect intensity. We found that the association between (i) emotional clarity and (ii) emotion differentiation was significantly smaller that the association between (iii) trait affect intensity and (iv) SRT-based affect intensity for both positive ($Z' = 3.70$, $p = .000$) and negative emotion differentiation ($Z' = 2.38$, $p = .02$). In the second set, we compared the association between emotional clarity and trait affect intensity to the associations between emotion differentiation (positive/negative) and SRT-based affect intensity. We found that the association between (i) emotional clarity and (ii) trait affect intensity was significantly smaller than the association between (iii) emotion differentiation and (iv) SRT-based affect intensity for both positive

($Z' = 3.43$, $p = .000$), and negative emotion differentiation ($Z' = 3.08$, $p = .001$).

We examined the unique relations between emotional clarity/positive and negative emotion differentiation and affect intensity/variability (trait, scenario-based positive and negative) by conducting a path analysis (using SPSS AMOS V.20.0; Arbuckle, 2011). We examined zero-order correlations between variables to ensure that the effects found in the path analysis were not an artefact of multicollinearity between variables. For the path analysis, we began with a full model in which paths led from emotional clarity and positive and negative emotion differentiation to all intensity and variability scores. Additionally, emotional clarity and positive and negative emotion differentiation scores were allowed to correlate, as were affect intensity and variability residuals. We then removed individual, non-significant paths from the model when indicated by no resulting decreases in model fit. The fit of the final reduced model was adequate, $\chi^2/df = 1.32$; adjusted goodness-of-fit index (*AGFI*) = .96; normal fit index (*NFI*) = .97; root-mean-square error of approximation (*RMSEA*) = .04, and was not significantly worse than the fit of the full model.

The results of the path analysis are presented in Figure 1.[3] Results were similar across analytic methods (path and zero-order), with all significant associations found in the path replicated in the zero-order correlation analysis. Consistent with our hypotheses (1) emotional clarity significantly, inversely predicted trait affect variability, and (2) negative emotion differentiation significantly, inversely predicted trait affect variability. Unexpectedly, positive and negative emotion differentiation significantly inversely predicted the SRT measure of affect intensity. Additionally, positive emotion differentiation significantly, inversely predicted the trait measure of affect intensity.

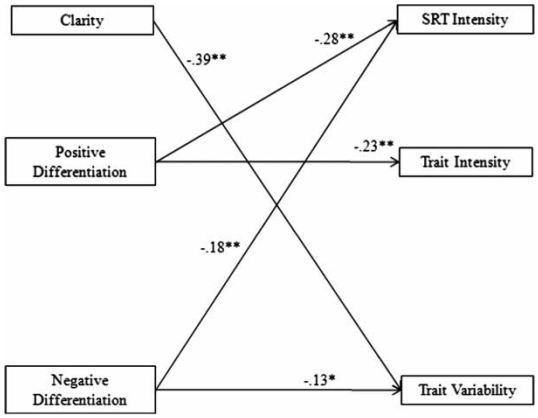

Figure 1. *Path analysis predicting affect intensity (trait, scenario-based; SRT) and variability (trait) from emotional clarity and emotion differentiation (scenario-based positive and negative). Intensity = affect intensity, Variability = affect variability, SRT = scenario-response task $\chi^2/df = 1.32$; AGFI = .96; NFI = .97; RMSEA = .04. **p < .01; *p < .05.*

STUDY 2

The goal of Study 2 was to replicate results found in Study 1 using an emotion differentiation score derived from experience sampling methods, as all published differentiation studies have been conducted in this manner (Barrett, 1998; Kashdan et al., 2010; Pond et al., 2012; Tugade et al., 2004). Affect intensity and affect variability were also assessed through experience sampling methods. Affect intensity and variability as well as emotional clarity were additionally assessed through self-report measures.

Methods

Participants

The participants ($n = 99$; 60.6%% female; M_{age} = 19.1 years, $SD = 1.2$, *Range* = 18–24 years), none of whom were included in Study 1, composed the sample from Study 2 of Dizén and Berenbaum (2011). Of those participants who reported their

[3] To avoid visual clutter, the following correlations are not included in Figure 1: positive emotion differentiation × negative emotion differentiation = .46; positive emotion differentiation × emotional clarity = −.01; negative emotion differentiation × emotional clarity = .12. Correlations between affect intensity and affect variability residuals were as follows: Scenario-response task (SRT) affect intensity × trait affect intensity = .26; SRT affect intensity × trait affect variability = .17; trait affect intensity × trait affect variability = .39.

ethnicity/race, most reported being White/Caucasian (78.3%), followed by Asian American (12.0%), African American (6.0%), various other ethnicities (2.4%), and Latino (1.2%).

Procedures

Participants completed a series of self-report measures and were individually instructed on the experience sampling protocol, including completing a full practice trial (see Dizén and Berenbaum, 2011, Study 2, for more details).[4] Participants carried a hand-held electronic device. For 15 days, participants were randomly prompted four times a day and recorded their experiences on the hand-held computer that they carried during their waking hours (10 a.m. to 10 p.m.). Participants were allowed up to 20 minutes to complete ratings should it be impossible to respond immediately (e.g., when exercising). To remove any reactive effects of the alarm itself, participants were asked to record their experiences "right before the alarm went off". The payment schedule was as follows: 10 cents for each completed sampling occasion and $30 for completion of the entire 15-day sampling period.

On each rating occasion, participants first identified the type of situation they were in immediately prior to the alarm sounding. Then participants rated their affective experiences, perceptions of themselves, and perceptions of others, with presentation of related questions counterbalanced across participants.

We obtained a satisfactory response rate over the 15-day time period (response rate $M = 85.6\%$, $SD = 10.8$, min. 55%, max. 100%), even after accounting for two exclusion criteria for responses (response rate $M = 82.9\%$, $SD = 13.3$, min. 51%, max. 100%). These two exclusion criteria were: (1) reaction times faster than 30 milliseconds were excluded from analysis as they were assumed to indicate participant error; and (2) the entire rating occasion was excluded from the analyses if there were more than five ratings (i.e., 20% of the total ratings in a given rating occasion) whose response times were less than 30 milliseconds (Christensen, Barrett, Bliss-Moreau, Lebo, & Kaschub, 2003).

Measures

Emotional clarity. As in Study 1, emotional clarity was assessed with the TMMS (Salovey et al., 1995). Internal reliability (i.e., Cronbach's α) in the current sample was .87. Descriptive statistics for all variables included in Study 2 are listed in Table 2.

Emotion differentiation. Emotion differentiation was measured by ratings of affective experience obtained at each rating occasion. Participants rated positive (i.e., happy, proud, joyful, love, excited, satisfied) and negative affect words (i.e., ashamed, angry, worried, sad, jealous, guilty) on a 6-point Likert scale (0 = *Not at all*; 6 = *Extremely*). Indices of positive and negative differentiation were computed in a manner identical to Study 1. The mean, standard deviation, and range of transformed intraclass correlation coefficients indicated an acceptable level of variation captured by this task (see Table 2).[5]

Affect intensity. Similar to Study 1, affect intensity was measured in two ways. First, we measured the intensity of positive and negative affect, respectively, by decomposing mean affect from each rating occasion into frequency and intensity components (Schimmack & Diener, 1997). As reported in Dizén and Berenbaum (2011, Study 2), we calculated composite positive and negative affect intensity scores, as discrete

[4] Shared between the current study and Study 2 in Disén and Berenbaum (2011) are participants, the ESM-based sampling procedure, and the ESM-based affect intensity and affect variability measures. Therefore, descriptions of these aspects of this study are similar to those presented in Disén and Berenbaum (2011). Additionally, the correlation coefficients between ESM-based measures of affect intensity and affect variability are reported in both articles. All other methods and results reported here are unique to this study and reported for the first time here.

[5] Similar to the event sampling study by Demiralp and colleagues (2012), we measured emotion differentiation by calculating the average Pearson correlation between pairs of affect items. Differentiation scores were highly related across the two computational methods for positive ($r = .89$, $p < .001$) and negative affect ($r = .84$, $p < .001$).

Table 2. *Descriptive statistics and zero-order correlation coefficients for Study 2*

	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1. Clarity	—								
2. Positive differentiation	.03	—							
3.Negative differentiation	.07	.35**	—						
4. ESM intensity (PA)	.20	−.40**	−.10	—					
5. ESM intensity (NA)	−.04	−.28**	−.47**	.36**	—				
6. Trait intensity	−.06	−.33**	−.28**	.31**	.40**	—			
7. ESM variability (PA)	.00	−.54**	−.29**	.46**	.52**	.29**	—		
8. ESM variability (NA)	−.22*	−.32**	−.56**	.14	.73**	.44**	.59**	—	
9. Trait variability	−.62**	−.10	−.12*	−.15	.14	.28**	.06	.31**	—
Mean	3.34	−0.21	0.26	3.97	3.04	3.76	1.42	1.03	13.10
Standard Deviation	0.70	0.35	0.32	0.71	0.48	0.45	0.31	0.35	2.78
Range	1.18–4.80	−1.09–0.59	−0.59–0.89	2.54–6.80	2.20–4.84	2.70–5.23	0.68–2.20	0.21–1.93	7.41–20.34

Notes: PA = positive affect; NA = negative affect; Intensity = affect intensity; Variability = affect variability; ESM = experience sampling method. $^{**}p < .01$; $^{*}p < .05$.

positive and negative intensity scores were highly correlated (Cronbach's alphas = .91, .83). In contrast to Study 1, positive and negative affect intensity composite scores were not highly correlated ($r = .36$, $p < .01$), although the magnitude of this correlation is similar to that found by Schimmack and Diener (1997) who sampled affects at random moments. We therefore included both positive and negative affect composite scores in our analyses. Second, we included a trait measure of affect intensity (AIM; Larsen et al., 1986), which was also administered in Study 1. Internal reliability (i.e., Cronbach's α) in the current sample was .88.

Affect variability. Affect variability was measured in two ways. First, similar to previous research (e.g., Larsen & Diener, 1987; Penner, Shiffman, Paty, & Fritzsche, 1994), we calculated the within-person standard deviation of each emotion, which reflects the average magnitude of variation a person exhibits in affect over time. As reported in Dizén and Berenbaum (2011, Study 2), we calculated composite positive and negative affect variability scores, as discrete positive and negative variability scores were highly correlated (Cronbach's alphas = .88, .89). Similar to Dizén and Berenbaum (2011), we elected to use separate positive and negative variability scores in our analyses although they were highly correlated ($r = .59$, $p < .01$; see Eid & Diener, 1999). Second, we included a trait a measure of affect variability, the Affective Lability Scale (ALS; Harvey et al., 1989), which was also administered in Study 1. Internal reliability (i.e., Cronbach's α) in the current sample was .94.

Results and discussion

In our first set of analyses, we replicated our results from Study 1 by finding that emotional clarity was not highly correlated with either positive or negative emotion differentiations, which themselves were moderately correlated at the zero-order level (see Table 2). Additionally, emotional clarity was inversely, strongly associated with trait affect variability and inversely, moderately

associated with ESM-based negative affect variability, but not associated ESM-based positive affect variability or trait or ESM-based affect intensity. Positive and negative emotion differentiation both were inversely, moderately to strongly associated with respective ESM-based affect intensity and variability. Positive and negative emotion differentiations were also associated with trait affect intensity, to a lesser degree, and negative emotion differentiation was associated with trait affect variability to a small degree.

We conducted two sets of comparisons of the absolute strength of correlation coefficients (two-tailed) using Fisher Z' transformations. In the first set, we compared the associations between emotional clarity and emotion differentiation (positive/negative) to the associations between trait and ESM-based affect intensity/variability (positive/negative). We found that the association between (i) emotional clarity and (ii) emotion differentiation was significantly smaller than the association between (iii) trait affect intensity and (iv) ESM-based affect intensity for both positive ($Z' = 2.01$, $p = .04$) and negative ESM-based affect intensity ($Z' = 2.45$, $p = .01$). However, we did not find significant differences in the association between (i) emotional clarity and (ii) emotion differentiation as compared to the associations between (iii) trait affect variability and (iv) ESM-based affect variability ($ps > .08$). In the second set, we compared the associations between emotional clarity and trait affect intensity/variability to the associations between emotion differentiation (positive/negative) and ESM-based affect intensity/variability (positive/negative). We found that the association between (i) emotional clarity and (ii) trait affect intensity was significantly smaller that the association between (iii) emotion differentiation and (iv) ESM-based affect intensity for both positive differentiation paired with positive affect intensity ($Z' = 2.52$, $p = .01$), and negative differentiation paired with negative affect intensity ($Z' = 3.12$, $p = .002$). However, we did not find significant differences in the association between (i) emotional clarity and (ii) trait affect variability as compared to the associations between (iii) emotion differentiation and (iv) ESM-based affect variability ($ps > .40$).

Similar to Study 1, we next examined whether emotional clarity and positive and negative emotion differentiation were uniquely related to affect intensity and variability by: (i) conducting a path analysis;[6] and (ii) computing zero-order correlations. Identical to Study 1, emotional clarity and positive and negative emotion differentiation scores were allowed to correlate, as were affect intensity and variability residuals. We then removed individual, non-significant paths from the model when indicated by no resulting decreases in model fit. The fit of the final reduced model was adequate, $\chi^2/df = 0.92$; adjusted goodness-of-fit index ($AGFI$) = .91; normal fit index (NFI) = .98; root-mean-square error of approximation ($RMSEA$) = .00, and was not significantly worse than the fit of the full model.

The results of the path analysis are presented in Figure 2.[7] Results were similar across analytic methods (path analysis and zero-order correlations), with all but two significant associations (i.e., emotional clarity – ESM positive and

[6] A sample size of 99 was deemed appropriate for conducting a path analysis with three predictors.

[7] To avoid visual clutter, the following correlations are not included in Figure 2: positive emotion differentiation × negative emotion differentiation = .35; positive emotion differentiation × emotional clarity = .03; negative emotion differentiation × emotional clarity = .07. Correlations between affect intensity and affect variability residuals were as follows: Experience sampling method (ESM) affect intensity – positive affect (PA) × ESM affect variability (PA) = −.00; ESM affect variability (PA) × trait affect variability = .01; trait affect variability × trait affect intensity = .29; trait affect intensity × ESM affect variability – negative affect (NA) = .37; ESM affect variability (NA) × ESM affect intensity (NA) = .65; ESM affect intensity (PA) × trait affect variability = −.05; ESM affect intensity (PA) × Trait affect intensity = .19; ESM affect intensity (PA) × ESM affect variability (NA) = −.04; ESM affect intensity (PA) × ESM affect intensity (NA) = .09; PA affect variability (PA) × trait affect intensity = .12; ESM affect variability (PA) × ESM affect variability (NA) = .57; ESM affect variability (PA) × ESM affect intensity (NA) = .14; trait affect variability × ESM affect variability (NA) = .18; trait affect variability × ESM affect intensity (NA) = .29; trait affect intensity × ESM affect intensity (NA) = .26.

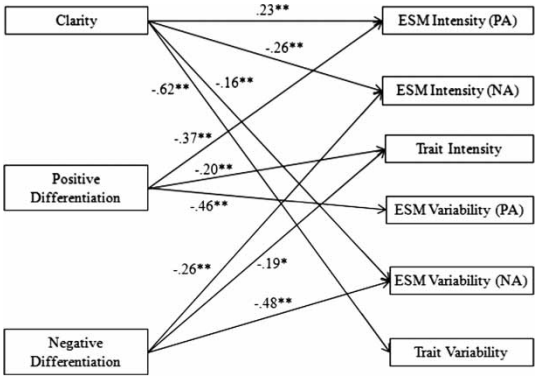

Figure 2. *Path analysis predicting affect intensity and variability (trait, event sampling-based positive and negative) from emotional clarity and emotion differentiation (event sampling-based positive and negative). NA = negative affect, PA = positive affect, Intensity = affect intensity, Variability = affect variability, ESM = experience sampling method.* $\chi^2/df = 0.60$; *AGFI = .94; NFI = .99; RMSEA = .00.* $^{**}p < .01$; $^{*}p < .05$.

negative affect intensity) found in the path analysis replicated in the zero-order correlations. Similar to Study 1 and consistent with our hypotheses (1) emotional clarity significantly, inversely predicted trait and ESM negative affect variability; (2) positive and negative emotion differentiation both significantly, inversely predicted respective ESM affect variability scores. Associations between affect intensity and emotion differentiation were consistent with Study 1: positive and negative emotion differentiations significantly, inversely predicted both event sampling-based and trait measures of affect intensity. Additionally, although this result was not replicated in the zero-order correlations, emotional clarity significantly, positively predicted ESM positive affect intensity and significantly, negatively predicted negative affect intensity.[8]

GENERAL DISCUSSION

In the first study to investigate associations between emotional clarity and emotion differentiation, we found that emotional clarity and emotion differentiation were associated to a very small and statistically insignificant degree. Furthermore, emotional clarity and emotion differentiation were differentially associated with trait and scenario-based/event-sampling-based measures of affect intensity and affect variability. The consistency of results across scenario-based (Study 1) and event-sampling-based (Study 2) methods used to calculate emotion differentiation, affect intensity and affect variability increases our confidence in the reliability and validity of our findings. At the very least, our findings indicate that clarity and differentiation, as they are typically measured, are very weakly related. This is important for interpreting the larger body of literature regarding emotional knowledge. Our findings suggest that just because a researcher finds that a particular variable is associated with emotional clarity one should not assume that variable will also be associated with emotion differentiation and vice versa. The current results add to the literature, demonstrating that retrospective self-reports versus momentary reports of emotion tap different aspects of human experience (e.g., Robinson & Clore, 2002). They also provide empirical support to theories positing multiple, heterogeneous facets to the construct of "emotional intelligence" (e.g., Gohm & Clore, 2000; Lindquist & Barrett, 2008). Finally, our results suggest that research examining both constructs may incrementally increase our understanding of

[8] We additionally tested whether affect intensity predicted emotional clarity and emotion differentiation using path analysis. In the first path analysis, using data from Study 1, we found that (i) trait affect intensity significantly predicted positive emotion differentiation ($\beta = -0.13$, $p = .05$), but not negative emotion differentiation or emotional clarity (ps>.08); and (ii) SRT-based affect intensity significantly predicted positive ($\beta = -0.23$, p<.001) and negative emotion differentiation ($\beta = -0.21$, $p = .002$), but not emotional clarity ($p = .51$). In the second path analysis, using data from Study 2, we found that: (i) trait affect intensity significantly predicted positive ($\beta = -0.21$, $p = .03$) and negative emotion differentiation ($\beta = -0.21$, $p = .05$), but not emotional clarity ($p = .83$); (ii) ESM-based positive affect intensity significantly predicted positive emotion differentiation ($\beta = -0.31$, p<.001) and emotional clarity ($\beta = 0.25$, $p = .009$), but not negative emotion differentiation ($p = .91$); and (iii) ESM-based negative affect intensity significantly predicted negative emotion differentiation ($\beta = -0.24$, $p = .02$) and emotional clarity ($\beta = -0.30$, $p = .003$), but not positive emotion differentiation ($p = .23$).

emotion regulation, well-being and mental disorders.

Although theoretically overlapping, emotional clarity and emotion differentiation were associated to a very small and statistically insignificant degree. In the introduction, we posited three potential explanations for these findings. Our first explanation concerns the assessment of these constructs, as emotion differentiation is conceptualised and measured more narrowly than is emotional clarity. Our measure of emotion differentiation was likely to have assessed the discrete subjective experience of affect in Studies 1 and 2. Alternatively, our measure of emotional clarity may have assessed any aspect of affective experience (e.g., physiological arousal, subjective experience) over an indefinite time frame. Therefore, the small relation between emotional clarity and emotion differentiation may have been explained by the different aspects of affect assessed by measures of these constructs over differing time frames. Our second, related, explanation concerns emotional clarity and emotion differentiation being based on different types of knowledge and sources of information, which are typically measured in different ways (Robinson & Clore, 2002). Emotional clarity is based on semantic knowledge and identity-related beliefs about affect, as assessed by retrospective self-report measures (used in Studies 1 and 2). Emotion differentiation is either based on semantic knowledge and situation-specific beliefs about affect, as assessed by scenario-based measures (used in Study 1), or episodic knowledge and experiential information (Robinson & Clore, 2002), as assessed by event-sampling-based measures (used in Study 2). In other words, the small association between emotional clarity and emotion differentiation may be attributable to them typically being dependent upon different types of knowledge and sources of information. We note, though, that self-reported emotional clarity need not be assessed using retrospective measures, and could potentially be assessed in an on-line manner (e.g., by asking an individual how clear he/she is about his/her emotions at any given moment; Vine & Nolen-Hoeksema, 2011).

Our first and second explanations suggest that methodological confounds accounted for the small relation between emotional clarity and emotion differentiation. Yet, we gained further evidence that suggests that our results reflect a true distinction between the constructs of emotional clarity and emotion differentiation, and are not due solely to methodological confounds. Specifically, the relations between trait measures of emotional clarity and scenario-based/event-sampling-based measures of emotion differentiation were significantly smaller than corresponding relations between: (i) trait and scenario-based/event-sampling-based measure of affect intensity, and (ii) a trait measure of affect variability and one of two event-sampling-based measures of affect variability. In other words, the discrepancies commonly found between measures of similar emotional constructs (Mauss et al., 2005) were larger for emotional clarity/emotion differentiation than for affect intensity, and to some extent, affect variability. As any methodological confound should have affected the measurement of affect intensity and variability to the same extent as the measurement of emotional clarity and emotional differentiation, the smaller correlation between the latter constructs may potentially be attributable to true differences between these constructs.

Consistent with the results presented in the previous paragraph, our third explanation that may account for the weak relation between emotional clarity and differentiation proceeds as follows. Whereas self-report measures of emotional clarity may assess the content of people's emotion knowledge, measures of emotion differentiation may assess people's ability to use that knowledge to make sense of their affective experiences on-line (see Lindquist & Barrett, 2008). Therefore, emotional clarity and emotion differentiation will be associated only to the extent that having knowledge about one's affective experience is associated with the ability to use that knowledge. Extrapolating from our results to generate a directional model, we hypothesise that emotional clarity, as a meta-emotional knowledge of one's affective experience, is developed through reflection on processes largely distinct from the

extent to which one differentiates their hypothetical or experiential emotion reports. Perhaps knowledge of one's affect, as manifested as emotional clarity, develops through reflection on attempting to understand the causes of one's affect, which has been identified and empirically validated as a facet of emotional clarity distinct from the general extent to which one can identify and distinguish between the types of affect experienced (Boden & Berenbaum, 2011). Alternatively, emotional clarity may develop through reflection on how quickly one can determine the type of affect that one is experiencing with some conviction (Lischetzke et al., 2005). Future research can test these and related hypotheses by investigating relations among both facets of emotional clarity, type and source awareness, and processes that potentially contribute to meta-emotional knowledge of affect (e.g., identity-related beliefs about emotions, time-to-identification of type of emotional state experienced).

Consistent with previous research, we found that both emotional clarity (Thompson et al., 2009) and emotion differentiation (Demiralp et al., 2012; Kashdan et al., 2010; Pond et al., 2012) were consistently, inversely associated with affect variability, and especially negative affect variability. As expected, the strongest relations were found between emotional clarity and a trait measure of affect variability, and between emotion differentiation and an event-sampling-based measure of affect variability. However, there was some crossover in these relations, as negative emotion differentiation was inversely associated with trait affect variability in Studies 1 and 2 (at the zero-order level). In Study 1, positive and negative emotion differentiation were inversely associated with scenario-based measures of affect intensity, and positive differentiation was inversely associated with trait affect intensity. Similarly, in Study 2, positive and negative emotion differentiation were both related to trait measures of affect intensity and each was most strongly related to the corresponding positive and negative event-sampling-based measures of affect intensity. At least one prior study has found moderately sized negative associations between emotion differentiation and affect intensity, although these relations were not statistically significant (Demiralp et al., 2012). These results are consistent with basic and applied research which has demonstrated that labelling affective states, such as occurs through emotion differentiation, contributes to reductions in affect intensity (Kircanski, Lieberman, & Craske, 2012; Lieberman, Inagaki, Tabibnia, & Crockett, 2011). Our only association between affect intensity and emotional clarity (emotional clarity – positive affect intensity in Study 2) may have been attributable to multicollinearity between variables.

Findings regarding affect variability and affect intensity together suggest that individuals who report less intense and variable affective experiences also tend to report greater emotional clarity and emotions with greater differentiation. Similar to previous researchers (Thompson et al., 2009), we hypothesise that higher levels of emotional clarity and emotion differentiation provide adaptive emotional information that facilitates effective emotion regulation. Without this information, emotional experience may be more intense and variable as emotion-regulation strategies are not effectively chosen or implemented.

Our results clearly demonstrate that emotional clarity and emotion differentiation are not related, at least as assessed by traditional measures. Of course, measures of both emotional clarity and emotion differentiation have associated problems. Traditional measures of emotional clarity suffer from commonly cited problems with self-report measures, such as questionable validity (Dunning, Heath, & Suls, 2004). We agree that people do not have direct access to sensory or cognitive information that potentially allow for an accurate judgement of emotional clarity (Barrett, 2006; Mauss & Robinson, 2009). However, self-report is one of the few ways to assess meta-emotional knowledge regarding one's affective experience (e.g., Spain, Eaton, & Funder, 2000).

There are at least two problems associated with the use of emotion differentiation scores. First, as a correlational method, the calculation of emotion differentiation is based on the variance of negative or positive mood/emotion words across repeated

administrations. Therefore, the measure of emotion must be administered as many times as necessary to obtain adequate variance between words. Typically, then, studies of emotion differentiation are limited to those that include event-sampling methods (Barrett et al., 2001; Demiralp et al., 2012; Kashdan et al., 2010; Pond et al., 2012; Tugade et al., 2004). Yet, as shown in Study 1 of the current research, emotion differentiation scores can be calculated from as few as 20 administrations of negative or positive mood/emotion words. A more substantial problem associated with the use of emotion differentiation scores concerns the validity of inferences that can be made with regard to the relation between emotion differentiation and adaptation. As noted by Lischetzke and colleagues (2005), a lack of emotional knowledge is not necessarily indicated by less complex representations of affective experience, and certainty regarding what one is feeling in the moment is not guaranteed by highly complex representations (Lischetzke et al., 2005). In fact, individuals with both high and low emotion differentiation may both clearly understand their affective experiences and report and act on these affective experiences in adaptive ways. Highly complex representations may even be maladaptive in situations requiring immediate action (e.g., a stranger threatens your child), as complex models might hinder categorisation of one's affective state and resulting action tendencies. Therefore, considering emotion differentiation as an indicator of knowledge of an individual's own affective experiences, more broadly, is problematic.

Ultimately, emotional clarity and emotion differentiation may be adaptive and related to well-being, or maladaptive and related to mental disorders in different ways. For example, being able to distinguish guilt from shame (via emotion differentiation) will enable someone to know when to make amends for a behaviour. Understanding what kinds of events tend to lead to different affective reactions (via emotional clarity) will enable someone to make choices that will increase the likelihood of desired affect and decrease the likelihood of undesired affect. To the extent that they represent unique aspects of affective knowledge, emotional clarity and emotion differentiation may yield incremental relations to emotion regulation, well-being, and mental disorder, more broadly. Future research testing related hypotheses by directly measuring emotion regulation, in addition to emotional clarity and emotion differentiation (e.g., Boden, Gross, Babson, & Bonn-Miller, in press; Boden et al., 2012) is likely to greatly improve our understanding of the relations between these constructs.

Future research testing related hypotheses will benefit from conceptually and empirically distinguishing between emotional clarity and emotion differentiation, and potentially including measures of both constructs. Additional measures of affective knowledge may prove useful in investigating affective understanding and adaptation. For example, as suggested by Lischetzke and colleagues' (2005, 2011) conceptualisation, the speed at which one can identify the type of affect experienced in the moment may be an important determinant of emotional clarity and, hence, adaptation. Therefore, future research may benefit from including response-time measures of emotional clarity, which can be assessed in the laboratory (Lischetzke et al., 2005) and in conjunction with experience sampling methods (Lischetzke et al., 2011). This would also provide for a test of the validity of our three explanations for our results described above.

In closing, we wish to note two important limitations to this research, in addition to those associated with measures of emotional clarity and emotion differentiation as described above. First, we were unable to infer causation from the present data, which were correlational in nature. Future research that addresses this limitation, such as through the use of experimental manipulations, may be able to directly investigate how/when reflection on emotion differentiation processes contributes to varying levels of emotional clarity. A second limitation is that our sample tended to be young in age. Future research with more diverse and representative samples is needed to address this limitation, as studies have shown that some facets of emotional experience vary by age

(e.g., Carstensen, Pasupathi, Mayr, & Nesselroade, 2000). Despite these limitations, our results, which converged across different methods used in independent samples, highlight the importance of both emotional clarity and emotion differentiation in understanding affective experience.

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