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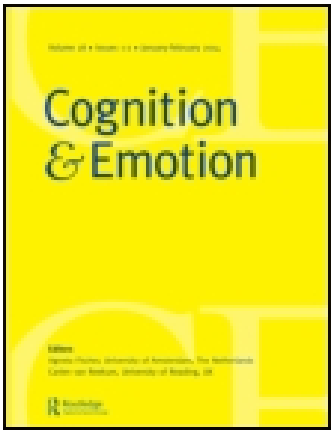


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Publication details, including instructions for authors and subscription information:
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Published online: 10 Jan 2014.

To cite this article: Yasemin Erbas, Eva Ceulemans, Madeline Lee Pe, Peter Koval & Peter Kuppens (2014) Negative emotion differentiation: Its personality and well-being correlates and a comparison of different assessment methods, Cognition and Emotion, 28:7, 1196-1213, DOI: 10.1080/02699931.2013.875890

To link to this article: http://dx.doi.org/10.1080/02699931.2013.875890

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COGNITION AND EMOTION, 2014
Vol. 28, No. 7, 1196–1213, http://dx.doi.org/10.1080/02699931.2013.875890

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# Negative emotion differentiation: Its personality and well-being correlates and a comparison of different assessment methods

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Previous research has shown that individual differences in negative emotion differentiation may play a prominent role in well-being. Yet, many basic questions about negative emotion differentiation remain unanswered, including how it relates and overlaps with related and known dimensions of individual differences and what its possible underlying processes are. To answer these questions, in the current article we present three correlational studies that chart the nomological network of individual differences in negative emotion differentiation in terms of personality, difficulties in identifying and describing feelings, and several indicators of well-being, propose a novel paradigm to assess it in the lab, and explore relationships with a possible underlying mechanism in terms of the motivation to approach or avoid emotions. The results affirm consistent relations between negative emotion differentiation and indicators of adjustment like negative affect, self-esteem, neuroticism, depression and meta-knowledge about one's emotions, and show how it is related to the motivation to experience affective states.

*Keywords:* Emotion; Emotion differentiation; Individual differences; Personality; Well-being.

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The emotion lexicon, the words people use to denote how they feel, consists of a vast array of affective descriptors. Yet, despite this rich-emotional palate, not everyone makes the same subtle distinctions when it comes to describing how they feel. While some may experience highly differentiated emotional states, others brush over their experiences with broader strokes.

Indeed, research has shown that individuals differ from each other to the extent in which they differentiate between their emotional experiences, something which has been labelled emotion

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The authors would like to thank Renee Thompson for her comments on an earlier version of this manuscript.

This research was supported by KU Leuven Research Council Grants [GOA/10/02] and [OT/11/031], by a research grant from the Fund for Scientific Research-Flanders to the last author. The fourth author is a doctoral researcher of the Fund for Scientific Research-Flanders.

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differentiation or emotional granularity (Barrett, Gross, Christensen, & Benvenuto, 2001). Particularly the extent in which people differentiate between negative emotions seems to play an important role in psychological well-being. Yet, there is a lot we do not know about what characterises people high or low in negative emotion differentiation and what underlies these differences. In the current article, we present a systematic study of individual differences in negative emotion differentiation. In three studies, we examine the relations between negative emotion differentiation and personality (Studies 1, 2 and 3), between negative emotion differentiation and well-being, in particular depression and the closely related alexithymia construct difficulties identifying and describing feelings (Studies 2 and 3), explore relations with potential underlying processes (Study 3), and propose a novel way to assess it more efficiently than it has been done in past research (Studies 2 and 3).

## Emotion differentiation

Emotion differentiation refers to the extent in which people distinguish between different emotional states and can be observed by looking at how people describe how they feel in response to different emotion-eliciting events (Barrett et al., 2001). The most common way to achieve this is to rely on experience sampling data, in which participants report their emotions in response to the events that take place during their daily life. Some people may subtly distinguish between stressed, worried, sad or annoyed states depending on the circumstance, whereas others may simply feel good or bad in each of the events. Put to the extreme, the crashing of a computer, missing the bus, and a fight with a partner could lead to a similar quality (though not necessarily quantity) of feeling "bad" or "awful" among people low in emotion differentiation, but to very different emotional qualities in high differentiators.

In line with this definition, emotion differentiation is most often inferred from the strength of the correlation between different like-valenced emotions across different occasions within a person (e.g., Barrett et al., 2001; Tugade, Fredrickson, & Barrett, 2004). When a person is characterised by relatively high correlations between like-valenced emotions across contexts [measured in terms of an intra-class correlation (ICC) coefficient], this is seen as an indication that they do not strongly distinguish between terms to describe how they feel (and are thus low in emotion differentiation). In contrast, relatively low within-person correlations between like-valenced emotions across situations indicate greater emotional specificity as people are reporting more divergent emotions depending on the circumstances.

## Emotion differentiation and well-being

The ability to make fine-grained distinctions between emotional states appears to have adaptive value and plays an important role in psychological well-being. As stated by the feelings as information perspective (Schwarz, 1990), we rely upon our feelings when appraising or judging our world. The more insight we have into our feelings, the better we can use them as a source of information. Possessing more differentiated knowledge about one's emotions may include understanding the cause of an emotional experience, its relational context, the expected bodily sensations associated with the emotion, its adaptive and maladaptive expressive modes, and the behaviours required to reduce or enhance the experience (Barrett et al., 2001). The more differentiated people's knowledge of their emotions and inner emotional life, the more likely they can adaptively respond to events, and cope with the resulting emotions.

Consistent with this, in one of the first empirical studies of emotion differentiation, Barrett et al. (2001) found that negative emotion differentiation was related to emotion regulation capacity. Individuals who differentiated more between negative emotions reported more frequent negative emotion regulation using a range of strategies, especially when dealing with intense negative emotions which are arguably in greatest need of regulation in the face of well-being and psychological adjustment (Gross & John, 2003; Gross & Muñoz, 1995).

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This initial finding has generated a line of research further exploring the relationship between emotion differentiation and well-being. Consistent with the idea that emotion differentiation helps people to more adaptively respond to events and regulate one's emotional responses, research shows that emotion differentiation buffers the need for aggressive behaviour when experiencing anger (Pond et al., 2012), and decreases the excessive use of alcohol in response to intense negative emotions (Kashdan, Ferssizidis, Collins, & Muraven, 2010). Furthermore, emotion differentiation appears to be lower in individuals suffering from clinical disorders associated with affective problems, such as autism spectrum disorder (Erbas, Ceulemans, Boonen, Noens, & Kuppens, 2013) and major depressive disorder (MDD; Demiralp et al., 2012), and seems to protect individuals with borderline personality disorder from engaging in harmful emotion regulation strategies such as non-suicidal self-injury (Zaki, Coifman, Rafaeli, Berenson, & Downey, 2013). This relevance for well-being seems to particularly hold for the differentiation of negative emotions. Not only do negative emotions encompass a wider variety of emotional states than positive emotions (see, e.g., classic emotion lexicons or taxonomies; Ortony, Clore, & Foss, 1987), leaving more to potentially differentiate, they also signal possible threats and challenges or disruptions of successful goal-pursuit, hence requiring more monitoring and coping. Indeed previous studies on emotion differentiation have demonstrated that mainly the differentiation of negative and not positive emotions is related to psychological well-being (e.g., Demiralp et al., 2012; Kashdan et al., 2010; Pond et al., 2012), though positive emotion differentiation does seem to be related to some other aspects of emotionality such as emotional variability and/or emotion intensity in other studies (Boden, Thompson, Dizen, Berenbaum, & Baker, 2013; Demiralp et al., 2012).

### The current studies

Despite the potential importance of negative emotion differentiation in relation to well-being, there is still much we do not know about the concept. The aim of the current article is to explore some of the basic questions that still surround negative emotion differentiation. We focus on three issues. First we want to investigate how negative emotion differentiation is related to well-established dimensions of individual differences in terms of experienced emotional intensity, personality traits, self-esteem, depression and alexithymia. Secondly, we will try to identify motivational variables relevant to negative emotion differentiation by examining how it is related to the need for affect. Finally, we will propose novel methods to assess emotion differentiation more efficiently.

## STUDY 1: EMOTION DIFFERENTIATION, EMOTIONAL INTENSITY, PERSONALITY AND SELF-ESTEEM

Almost no research has systematically examined how negative emotion differentiation is related to basic individual difference dimensions which are known to be relevant to well-being. Knowledge about how negative emotion differentiation is associated with other well-established individual difference variables will help us gain a better understanding of what negative emotion differentiation is and is not. Investigating its relationship with these basic dimensions helps to build a nomological network to validate the concept (Cronbach & Meehl, 1955). In this first small-sample study, we examined how negative emotion differentiation is related to negative emotional intensity, to the five-factor theory of personality dimensions and to trait self-esteem.

Emotional intensity is a well-examined facet of emotional experience and it is known to be related to a wide range of outcomes including well-being (see Larsen, 2009, for a review). Moreover, as demonstrated by Barrett et al. (2001), individuals low in negative emotion differentiation seem to have difficulties regulating their emotions effectively, which in turn may lead to elevated levels of the experienced emotion. Indeed, recent research by Boden et al. (2013) shows that the experienced

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intensity of negative emotions is inversely related to negative emotion differentiation, though this relationship did not appear to be very strong in the study by Demiralp et al. (2012). However, establishing a relationship between emotional intensity and negative emotion differentiation may help to construct the nomological network of negative emotion differentiation further, as well as help to validate the novel methods that we propose to assess emotion differentiation in studies 2 and 3. Therefore, we will assess whether lower intensity of negative emotions is related to higher levels of negative emotion differentiation.

Of the five-factor personality dimensions, neuroticism and extraversion are most closely related to affective functioning, with extraversion being particularly related to the experience of positive and neuroticism to that of negative emotions (e.g., Larsen & Ketelaar, 1991; Rusting & Larsen, 1997). Evidence suggests that the negative emotionality associated with neuroticism is at least partly due to emotion regulatory factors (Ng & Diener, 2009). Therefore, we expect neuroticism to be related to lower levels of negative emotion differentiation.

Self-esteem is among the most widely studied aspects of well-being. For instance, higher self-esteem is related to increased positive and decreased negative emotionality (e.g., Watson, Suls, & Haig, 2002), and lower self-esteem is related to depression (e.g., Orth, Robins, & Roberts, 2008). Regarding emotion regulation, individuals with low self-esteem tend to use maladaptive strategies such as expressive suppression, rather than reappraisal when regulating their emotions (Gross & John, 2003), and appear to be less motivated to repair negative mood (Heimpel, Wood, Marshall, & Brown, 2002; Wood, Heimpel, Manwell, & Whittington, 2009). On the basis of these findings, we expect self-esteem to be positively related to negative emotion differentiation.

# METHOD

## Participants

Fifty Participants (24 male) with a mean age of 21.58 years (*SD* = 3.87), were recruited through the Careers & Employment service of the University of Melbourne. They were paid AU$40 for participation. Of these participants, 36% was Anglo-European Australian, 46% Chinese, 12% from other Asian countries and the remaining participants had a Latin-American or Middle-Eastern background. Sample size was determined based on a power calculation of expected effect sizes in personality research ($r$ = .20 to .30).

## Materials and procedure

In a first session, participants received a palmtop computer along with instructions for its use. For the next week, participants carried the palmtop during their normal activities and responded to the questions when signalled. After a week, participants attended a second session in which the palmtops were returned, and they were paid for participation. In addition, participants completed questionnaires during lab sessions both before and after the experience sampling period. Only the questionnaires relevant to this project are reported.

### *Negative emotion differentiation*

Similar to previous research on emotion differentiation (see, e.g., Barrett et al., 2001; Demiralp et al., 2012; Kashdan et al., 2010), negative emotion differentiation was assessed on the basis of experience sampling data (Csikszentmihalyi & Larsen, 1987) on people's emotional responses to the events in their daily lives. Participants carried palmtop computers (Palm Tungsten E2) that were programmed to beep ten times a day during seven consecutive days. At each beep, participants were asked to report how they felt at that moment, next to a limited number of other questions not related to the present research. The beeps were programmed according to a stratified random-interval scheme, with waking hours of each day being divided in 10 equal intervals, in which a beep was programmed randomly. At each beep, the palmtop prompted participants to rate their responses to a number of questions (in randomised order) including how angry, anxious, depressed and stressed they felt at the moment of the beep, using a scale

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ranging from 0 (not at all) to 5 (very much). The emotion terms were selected to span the entire range of the negative arousal dimension of Russell's circumplex model (ranging from low arousal depression to high arousal stress and anxiety; Russell, 1980), while limiting the total number of terms given the need for brevity in the context of experience sampling. Compliance was good: overall, participants responded to 74% (*SD* = 17) of the programmed beeps. A negative emotion differentiation index was computed for each participant by calculating the ICC measuring consistency[1] between the four emotions across the different time points (Shrout & Fleiss, 1979). As a high ICC reflects low emotion differentiation, we reversed the ICCs such that higher values indicate more negative emotion differentiation for ease of interpretation.

### *Emotional intensity*

Similar to Boden et al. (2013) and Demiralp et al. (2012), a negative emotional intensity index was derived for each participant by averaging all negative emotion ratings over the time-points of the experience sampling period. High scores on this index are an indication that negative emotions have been reported with high intensity.

### *Questionnaires*

To measure the five-factor personality dimensions, we used Goldberg's (1999) International Personality Item Pool (IPIP) measure. This measure consists of 50 items, with 10 items each measuring extraversion, agreeableness, conscientiousness, openness to experience and neuroticism. The items were rated on five-point scales, ranging from 1 (*very inaccurate*) to 5 (*very accurate*). The reliability of the scales ranged from acceptable to good (Cronbach's $\alpha$ = .78 to .87). Self-esteem was measured using the Rosenberg (1965) Self-esteem Scale (RSE) which is a widely used scale to measure general self-esteem. The 10-item scale consists of 5 indicative (e.g., "On the whole, I am satisfied with myself") and 5 contra-indicative (e.g., "I feel I do not have much to be proud of") items. Responses were made on a four-point Likert scale, ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). After recoding the contra-indicative items, the average score reflects general self-esteem. The scale had a good internal consistency (Cronbach's $\alpha$ = .80). The descriptives of all variables of the first study and their intercorrelations can be found in Table 1.

## RESULTS AND DISCUSSION

The average ICC was .64 (*SD* = 0.19), which is comparable to the average differentiation of negative emotions found in previous studies (e.g., Kashdan et al., 2010). Table 1 reports interrelations between the negative emotion differentiation index (reversed ICC scores) and other variables. As the emotion differentiation index did not conform to a normal distribution, Spearman's rank order correlation coefficients are reported.

We first assessed how negative emotion differentiation was related to negative emotional intensity and found a marginally significant negative relationship between the two. This is consistent with previous findings (e.g., Boden et al., 2013), and supports the notion that a more differentiated knowledge of an individual's own emotions is associated with lower levels of negative emotionality.

Our next prediction was that negative emotion differentiation would be related to neuroticism. Our results showed a marginally significant negative relationship between emotion differentiation

[1] In previous studies on emotion differentiation, ICCs were generally used that measure absolute agreement (Barrett, 1998; Kashdan et al., 2010; Pond et al., 2012; Tugade et al., 2004). Such ICC takes both the correlations and the level of the experienced emotions into account. As we argue that only the correlations among the emotions are relevant in the context of emotion differentiation, we used the consistency ICC measure instead. However, the correlations between the absolute and the consistency measures are high: $r_s$ = .95, $p$ < .001 for Study 1, $r_s$ = .97, $p$ < .001 for Study 2, and $r_s$ = .99, $p$ < .001 for Study 3.

**Table 1.** *Means, standard deviations and correlations between questionnaire measures in Study 1*

| *Measure* | M | SD | *1* | *2* | *3* | *4* | *5* | *6* | *7* |
|---|---|---|---|---|---|---|---|---|---|
| 1. ICC | 0.64 | 0.19 | | | | | | | |
| 2. Intensity | 2.10 | 0.75 | −.27† | | | | | | |
| 3. Neuroticism | 2.85 | 0.71 | −.27 | .44** | | | | | |
| 4. Extraversion | 3.21 | 0.75 | .01 | .22 | .16 | | | | |
| 5. Openness | 3.66 | 0.60 | −.02 | .13 | .39** | .30* | | | |
| 6. Agreeableness | 3.91 | 0.41 | .05 | −.08 | −.04 | .36** | −.09 | | |
| 7. Conscientiousness | 3.32 | 0.61 | .03 | −.21 | −.04 | −.07 | .10 | −.07 | |
| 8. Self-esteem | 4.38 | 0.68 | .35* | −.38** | −.40** | .16 | .16 | .08 | .13 |

†$p < .10$; *$p < .05$; **$p < .01$.

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and neuroticism. Emotion differentiation was not related to other personality traits. Our final prediction was that negative emotion differentiation would be related to higher self-esteem. Indeed, we found a positive relationship between the negative emotion differentiation index and self-esteem, indicating that higher differentiation of negative emotions is related to higher trait self-esteem.

Together, these first findings support the idea that differentiation of negative emotions is indeed related to traits that are viewed as indicators of psychological well-being, something which will be further explored in Study 2 using a larger sample.

## STUDY 2: EMOTION DIFFERENTIATION, ALEXITHYMIA AND DEPRESSION

In addition to conceptually replicating the findings of Study 1 in a larger sample, our aim in Study 2 was to investigate how negative emotion differentiation is related to alexithymia and depression. We furthermore propose a novel method for measuring emotion differentiation in the lab.

### Alexithymia and depression

Alexithymia refers to deficits in emotional knowledge which can lead to disturbances in emotional functioning. First described by Sifneos in 1973, alexithymia literally means "absence of words for emotions" and is associated with deficiencies in understanding, processing and describing emotions, distinguishing them from bodily arousal and focusing more on external events rather than inner experiences. Alexithymia is a well-studied construct and is found to be implicated in several instances of mental ill-health, varying from bulimia nervosa (De Groot, Rodin & Olmsted, 1995) to depression (e.g., Parker, Bagby, & Taylor, 1991).

The components of alexithymia most relevant to the concept of negative emotion differentiation are the inability to identify one's own emotions, to distinguish experienced emotions from one another, as well as having difficulty in describing the experienced emotions. The definition of alexithymia and more specifically of the difficulties identifying and describing emotions dimensions suggests considerable overlap with emotion differentiation. However, these relationships have not yet been empirically studied. The only exception we know of is a study by Lundh and Simonsson-Sarnecki (2001), in which no relationship between alexithymia and negative emotion differentiation was found. However, in their study emotion differentiation was operationalized in terms of daily moods (in the evening, participants were asked to describe their mood of the past day) instead of emotional states, and is therefore not compatible with the commonly used definition of emotion differentiation. From the perspective of cross-validation, it is important to establish how individual differences in negative emotion

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differentiation are related to alexithymia, not in the least because of their mutual relationship with depression (Demiralp et al., 2012). More specifically, we would expect low capacity to differentiate between negative emotions to be related to the components of alexithymia that particularly involve difficulties with identifying and communicating emotions. However, a recent study by Boden et al. (2013) shows that clarity of emotions, an emotional intelligence construct closely related to the difficulties identifying feelings dimension, is not related to differentiation of negative emotions (nor of positive emotions). This study suggests that the meta-knowledge individuals have about their emotional world is a different construct from the ability to effectively differentiate between different emotional experiences. In the current study we aim to further investigate how individuals' understanding of their emotions is related to the level of emotion differentiation, by examining how the ability to differentiate between negative emotions is related to the well-established construct of alexithymia.

Apart from its relationship with alexithymia, we were also interested in how negative emotion differentiation is related to depression. Demiralp et al. (2012) argue that previous studies on depression have demonstrated a relationship between elevated levels of depression and difficulties in distinguishing different elements of information from one another. For example, depression is related to over-general memory: When recalling autobiographical events, highly depressed individuals more often report categories of events instead of a single specific memory (e.g., Kuyken & Dalgleish, 1995; Williams et al., 2007). Depression furthermore appears to be related to reduced executive control (Dalgleish et al., 2007). In this vein, recent research has demonstrated that individuals with MDD tend to have less differentiated negative emotional experiences than healthy controls (Demiralp et al., 2012). Building on this finding, we want to investigate whether depression severity in the normal population is also related to difficulties in negative emotion differentiation.

### An alternative method for assessing emotion differentiation

Until now, emotion differentiation has been measured in the context of experience sampling studies. Although experience sampling methods have high ecological validity, this procedure of assessing also has drawbacks. First of all, experience sampling methods are relatively expensive in terms of time, effort, and participant burden. Second, it is not possible to control the events that people encounter in their daily lives. This may be problematic, because differences in encountered events may be partly responsible for differences in emotion differentiation. For instance, some participants may go through a very calm period in life, whereas others may go through a more demanding period, with consequences for the range of emotions potentially experienced. To address these issues, we propose an alternative approach to assess emotion differentiation. In this approach, as in experience sampling, emotion differentiation is examined in terms of the covariation of people's emotional experiences across a variety of contexts. However, unlike in experience sampling, this is done in response to a fixed, controlled set of contexts. This has the advantage that emotion differentiation can be measured quickly and inexpensively in the lab (requiring only one single session), and that it controls for potential confounding individual differences in the events people encounter in daily life (Frederickx & Van Mechelen, 2012).

## METHOD

### Participants

Participants were 131 (20 male) undergraduate students at the KU Leuven, with a mean age of 18.48 years (*SD* = 1.74). All participants had a Belgian background. Participation was a partial fulfilment of course credits, therefore the sample size was determined by the number of students participating in this course.

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## Materials and procedure

The data were obtained during a collective testing session. Participants started with an emotion task designed to measure emotion differentiation, followed by a number of questionnaires. Only the questionnaires relevant for this project are reported.

### *Negative emotion differentiation*

The task (first used in Ceulemans, 1999) consisted of two parts. In the first part, participants had to write down the names of 22 target persons who corresponded with predefined descriptions of people (e.g., write down the names of your three best friends, write down the name of your mother). In the second part, these target persons were rated on 35 emotion terms. In other words, participants had to indicate how they felt towards the target persons (e.g., their three best friends, their mother) by rating each target person on the 35 emotions. Of these emotion terms, 20 were negative (bored, awkward, sad, reserved, pity, angry, confused, dislike, inferior, sad, frustrated, jealous, concerned, defensive, scared, nervous, unpleasant, disgust, upset and hateful). As we were only interested in negative differentiation, the emotion differentiation index was determined based on the 20 negative emotion terms by calculating and reverse coding the average ICC across targets for each participant.

### *Emotional intensity*

An emotional intensity index was computed for each participant by averaging all emotion ratings on the emotion differentiation task. Again, high scores on this index are an indication that negative emotions are reported with high intensity.

### *Questionnaires*

Self-esteem was again measured using the RSE (Cronbach's $\alpha$ = .91). To measure the *Big-Five personality* traits we used the Dutch translation of the Ten-Item Personality Inventory (TIPI; Hofmans, Kuppens, & Allik, 2008). Each of the traits extraversion, agreeableness, conscientiousness, openness to experience and emotional stability was measured with two items, and the reliability of the scales ranged from very low (.20 for conscientiousness) to moderate (.72 for extraversion).

Alexithymia was measured with the Toronto Alexithymia Scale (TAS; Bagby, Parker, & Taylor, 1994a, 1994b), which is the most commonly used instrument to measure alexithymia. The TAS is a 20-item scale which consists of three subscales: Difficulty Describing Feelings (DDF), measuring the extent in which individuals are capable of describing emotions (e.g., "It is difficult for me to find the right words for my feelings"); Difficulty Identifying Feelings (DIF), which indicates the extent in which individuals have difficulties identifying their own feelings and those of others (e.g., "When I am upset, I don't know if I am sad, frightened, or angry"); and Externally Oriented Thinking (EOT), measuring the extent in which individuals direct their attention externally instead of towards emotions (e.g., "I prefer talking to people about their daily activities rather than their feelings"). Note that particularly the DIF subscale seems to have the most similar (reverse) definition to that of emotion differentiation. Items were rated on five-point Likert scales ranging from 0 (*not at all*) to 4 (*very much*). After recoding the contra-indicative items, mean scores were computed for the scales, with higher scores indicating more alexithymia. The reliabilities of the scales were $\alpha$ = .79 for the DIF scale, $\alpha$ = .80 for the DDF scale, and $\alpha$ = .61 for the EOT scale.

Depression was measured using the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977), which is a 20-item scale consisting of 16 indicative (e.g., "my sleep was restless") and 4 contra-indicative (e.g., "I enjoyed life") items. Participants were asked to respond to the items on a four-point Likert scale ranging from 0 (*not at all*) to 3 (*very much*), with higher scores reflecting more depressive symptoms after recoding. The reliability of the scale was high (Cronbach's $\alpha$ = .92). Descriptives and inter-correlations between the variables can be found in Table 2.

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Table 2. *Means, standard deviations and correlations between questionnaire measures in Study 2*

| *Measure* | M | SD | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* | *11* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. ICC | 0.85 | 0.13 | | | | | | | | | | | |
| 2. Intensity | 2.02 | 0.56 | −.61** | | | | | | | | | | |
| 3. Neuroticism | 3.62 | 1.35 | −.17† | −.24** | | | | | | | | | |
| 4. Extraversion | 4.74 | 1.60 | .03 | −.18* | −.09 | | | | | | | | |
| 5. Openness | 5.24 | 1.29 | .03 | −.07 | −.14† | .34** | | | | | | | |
| 6. Agreeableness | 5.35 | 1.02 | −.03 | −.24** | −.14 | .06 | .04 | | | | | | |
| 7. Conscientiousness | 4.18 | 1.31 | −.06 | .03 | .15† | −.10 | −.04 | .00 | | | | | |
| 8. Self-esteem | 3.63 | 0.60 | .19* | −.40** | −.47** | .35** | .16† | .25** | .10 | | | | |
| 9. Difficulty describing feelings | 2.02 | 0.94 | .03 | .20* | .27** | −.33** | −.18* | −.05 | −.08 | −.34** | | | |
| 10. Difficulty identifying feelings | 1.32 | 0.79 | −.20* | .38** | .47** | −.11 | −.12 | −.21* | .02 | −.50** | .53** | | |
| 11. Externally oriented thinking | 2.43 | 0.58 | .03 | .00 | .05 | −.19* | −.34** | −.07 | −.15† | −.12 | .24** | .08 | |
| 12. Depression | 1.45 | 0.55 | −.20* | .40** | .43** | −.16† | −.08 | −.12 | −.15† | −.58 | .35** | .51** | .08 |

†$p < .10$; *$p < .05$; **$p < .01$.

## RESULTS AND DISCUSSION

The average emotion differentiation for the negative emotions was .85 (*SD* = 0.13), which is higher than the average level of differentiation found in previous studies (e.g., Kashdan et al., 2010), and higher than the average of Study 1. Table 2 reports the Spearman rank order correlations between the emotion differentiation index and the other variables.

Replicating our previous findings, we obtained a negative relationship between negative emotion differentiation and negative emotional intensity and neuroticism (though only marginal for the latter), and a significant positive relationship with self-esteem. Again, negative emotion differentiation was not correlated to the other personality traits. These replications show that the relationships found in Study 1 are reliable. However, compared to Study 1, the relationship between negative emotion differentiation and negative emotional intensity was considerably larger in this study.

Furthermore, negative emotion differentiation was significantly negatively related to the DIF subscale of the TAS, but not to the other TAS subscales. Also in line with our prediction, we found a negative relationship between negative emotion differentiation and the CES-D, indicating that low differentiation between negative emotions is related to elevated levels of depression.

Study 2 replicated the relationships between negative emotion differentiation and negative emotional intensity, neuroticism and self-esteem reported in Study 1. It is important to emphasise that this replication was obtained using the alternative method of assessing emotion differentiation in the lab, supporting the external validity of the lab task.

Moreover, consistent with expectations, negative emotion differentiation was associated with other indicators of well-being. Specifically, we found that a sub-facet of alexithymia that relates to having trouble identifying one's own feelings and those of others, correlates negatively with negative emotion differentiation. Although this relationship was only moderate ($r = .20$), it should

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be kept in mind that the two measures are based on very different methodologies: Alexithymia was measured with a self-report questionnaire, while the negative emotion differentiation index instead reflects an indirect, "performance-based" measure of emotion differentiation. As in other subfields documenting a weak but positive relationship between direct and indirect measures (e.g., Spangler, 1992), this result points to both the overlap between and distinctiveness of both measures, and is in line with previous findings regarding the relationship between negative emotion differentiation and emotional clarity (Boden et al., 2013). Yet, the fact that the two are related, even to a limited extent, further validates the emotion differentiation construct, and supports the novel method proposed to measure it.

Finally, negative emotion differentiation was found to be associated with depression in our sample: Individuals high on negative emotion differentiation reported fewer depression symptoms compared to low differentiators. These results replicate the findings from Demiralp et al. (2012) in which a relationship with MDD and negative emotion differentiation was demonstrated, and indicate that not only clinical forms of depression, but also depression symptoms in the normal population are related to difficulties in negative emotion differentiation.

One limitation of this study, and in particular of the novel task designed to measure emotion differentiation, is that the items in the task were not completely standardised. Although the targets in the task were predefined (e.g., three best friends), the actual persons assigned to these targets of course differed between participants. Furthermore, it can be argued that the task did not necessarily measure the feelings of the participants, but instead measured how they feel in general towards the target person, and not at a particular moment. Since these concerns may have been the cause of the high average ICC found in this study as well as the strong relationship between the negative emotion differentiation index and the negative emotional intensity index, in Study 3 we adapted the task to tackle these limitations.

## STUDY 3: EMOTION DIFFERENTIATION AND AFFECTIVE MOTIVATION

A first purpose of this third study was to identify a possible motivational correlate of negative emotion differentiation. In general, we expect that emotion differentiation results from both motivational (do people want to differentiate between negative emotions?) and resource-bound (do people have the capacity to differentiate between emotions?) factors that may allow or prevent an individual from dealing with his or her feelings adequately. As a result of this, the individual is not or does not learn to be equipped with adaptive emotion regulatory skills, resulting in problematic emotional adjustment. In this study, we examined how motivational aspects may be associated with individual differences in emotion differentiation.

One motivational aspect that may underlie low negative emotion differentiation may be the motivation to avoid being confronted with one's (specific) negative emotional experiences. People differ in their inclination to approach or avoid specific painful emotional experiences and all the specific meanings attached to them (Maio & Esses, 2001). Notably, a desire to avoid intense negative emotional experiences is thought to underlie over-generalised memory, which is also considered to play a key role in depression (e.g., Hermans, Defranc, Raes, Williams, & Eelen, 2005; Kuyken & Dalgleish, 1995). A similar mechanism may contribute to negative emotion differentiation, such that low differentiating individuals may try to avoid being confronted with their inner emotional world by generalising across different emotions. Such mechanism may have adverse effects on emotional functioning, with consequences for well-being and vulnerability to affective disorders.

In the current study, we will test the hypothesis that a motivation to avoid being confronted with one's negative emotional experiences may make individuals try to generalise more across emotions. More specifically, we will examine whether negative emotion differentiation is related to the need for affect, which is defined as the general

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motivation to approach or avoid emotion-inducing situations and activities (Maio & Esses, 2001). In line with the reasoning outlined above, we predict that individuals who have a high motivation to avoid negative emotions will generalise across emotions and hence show lower negative emotion differentiation.

A second aim of this study is to improve the emotion differentiation task used in experiment 2. Although the task resolved some of the issues of experience sampling, one could argue that it did not assess participants' direct feelings, and that the emotional stimuli were still not controlled for enough because participants were free to choose their own targets. Therefore, in the current study, we created an emotion task that used standardised emotional stimuli and a systematic list of emotional labels, and investigated the extent in which each of these emotions was evoked by the stimuli. Finally, we sought to replicate the relationships between negative emotion differentiation, alexithymia and depression.

## METHOD

### Participants

Participants were 170 (32 male) undergraduate students at the KU Leuven, with a mean age of 18.42 years (*SD* = 1.13), of which 94.7% had a Belgian background. They received course credits for participation (and sample size was again determined by the number of students participating in this course).

### Materials and procedure

The data were obtained during a collective testing session. Participants were seated in an auditorium, and given booklets to complete. Instructions were presented on a large screen and were orally explained to participants. Next, the emotion task stimuli were projected on the screen, and participants reported their responses in the booklet. After the emotion task, participants completed the remaining questionnaires. Again, only the questionnaires relevant for this project are reported. The session lasted approximately 30 minutes.

#### *Negative emotion differentiation*

Similarly to the task used by Boden et al. (2013), in this new version of the task, participants were asked to rate their emotional responses to a set of standardised emotional stimuli, which were selected to match 20 emotion terms. The list of emotion terms consisted of the 16 emotion words that represent the four negative discrete emotion categories proposed by Diener, Smith, and Fujita (1995) (Fear, worry, anxiety, nervousness, anger, irritation, disgust, rage, shame, guilt, regret, embarrassment, sadness, loneliness, unhappiness and depression). While the list of emotion words is smaller compared to the previous study, it is specifically designed to represent the range of negative emotions. To cover an even broader array, the emotions jealous, envious and two Dutch words for inferior were added to this list.

The standardised emotional stimuli consisted of a selection of 20 emotion pictures taken from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 1995). The pictures were selected to match the affect terms from the list as well as possible. This was done to make it possible for participants to respond with very specific, differentiated profiles of emotional responses to the stimuli.

Participants were instructed to indicate the extent in which they experienced each emotion in response to each picture, so that each picture had to be rated on the 20 affect terms mentioned above using seven-point Likert scales ranging from 0 (*not at all*) to 6 (*very much*). The negative emotion differentiation index was again computed by calculating the ICC measuring consistency between emotion terms, across pictures, for each participant, and reverse-coded.

#### *Emotional intensity*

For each participant, an emotional intensity index was computed by averaging the emotion ratings on the emotion differentiation task.

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### *Questionnaires*

As in Study 2, depression was measured with the CES-D (Cronbach's $\alpha$ =.83). Alexithymia was measured with the TAS (Cronbach's alphas were .84, .87 and .65 for the subscales of DDF, DIF and EOT, respectively).

The Need for Affect scale (Maio & Esses, 2001) is a 26-item scale which measures individuals' general motivation to approach or avoid situations and activities that are emotion inducing for themselves or others (Maio & Esses, 2001). The scale consists of two 13-item subscales that measure either the approach (e.g., "I am a very emotional person"; "I approach situations in which I expect to experience strong emotions") or the avoidance ("People can function most effectively when they are not experiencing strong emotions"; "I would love to be like Mr. Spock, who is totally logical and experiences little emotion") motivation towards emotions. Participants responded to the items on a seven-point scale ranging from 0 (*not at all*) to 6 (*very much*). Both scales had high internal consistency (Cronbach's $\alpha$ = .87 for the approach scale and .90 for the avoidance scale). The descriptives and the correlations between the measures can be found in Table 3.

## RESULTS AND DISCUSSION

The average emotion differentiation for the negative emotions was .65 (*SD* = 0.25) which is again comparable to the average differentiation found in Study 1 and previous studies (e.g., Kashdan et al., 2010). Table 3 reports the Spearman rank order correlations between the negative emotion differentiation index and the other variables.

Similar to the previous study, negative emotion differentiation was found to be negatively related to the CES-D and to the negative emotional intensity index. This time the relationship between differentiation and intensity was less strong than in Study 2, and again comparable to the Boden et al. (2013) findings. Furthermore, the negative emotion differentiation index was negatively related to the difficulty identifying feelings and difficulty describing feelings scales, but not to the externally oriented thinking scale. In other words, our results from the previous study showing relationships between negative emotion differentiation, negative emotional intensity, difficulties identifying feelings and depression were replicated in this study, which means that these findings are reliable.

There was a significant negative relationship between negative emotion differentiation and the approach scale, as well as between negative emotion differentiation and the avoidance scale. The approach and avoidance scales were unrelated. This indicates that both a high avoidance motivation as well as a high approach motivation towards emotions is related to less negative emotion differentiation. While we expected high avoidance motivation to be related to less negative emotion differentiation, the result with respect to emotion approach was not expected. Moreover, this finding

**Table 3.** *Means, standard deviations and correlations between questionnaire measures in Study 3*

| *Measure* | M | SD | *1* | *2* | *3* | *4* | *5* | *6* | *7* |
|---|---|---|---|---|---|---|---|---|---|
| 1. ICC | 0.65 | 0.25 | | | | | | | |
| 2. Intensity | 1.52 | 0.75 | −.45** | | | | | | |
| 3. Difficulty describing feelings | 2.50 | 1.40 | −.19* | −.03 | | | | | |
| 4. Difficulty identifying feelings | 1.91 | 1.24 | −.32** | .19* | .63** | | | | |
| 5. Externally oriented thinking | 2.18 | 0.62 | .04 | −.01 | .27** | .05 | | | |
| 6. Depression | 1.88 | 1.17 | −.15* | .25** | .37** | .56** | .00 | | |
| 7. Need for affect – approach | 3.28 | 0.88 | −.27** | .29** | −.06 | .19* | −.31** | .17* | |
| 8. Need for affect – avoidance | 1.88 | 1.10 | −.18* | .01 | .55** | .49** | .28** | .42** | −.05 |

$^{\dagger}p < .10$; $^{*}p < .05$; $^{**}p < .01$.

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seems contradictory. A possible explanation might be that individuals who do not differentiate a lot between emotions may have difficulties understanding their own emotions. Approaching emotions might therefore help them to understand their emotions better because their insufficient abilities to differentiate between emotions might motivate them to approach emotions more. However, this notion was not supported by the data.[2] To get a better understanding of what these results mean exactly, and especially which causal links may relate these variables to each other, more extensive research is needed.

Finally, the findings of this study, and especially the replications of previous findings, are also important from the viewpoint of validating the adapted emotion task used to measure emotion differentiation. As noted before, the average level of negative emotion differentiation and the relationship between negative emotion differentiation and negative emotional intensity are now in line with previous research (e.g., Boden et al., 2013), which was not the case in Study 2. In the current task participants were asked to report their experienced emotions in response to emotional stimuli, which is much more similar to how emotion differentiation is assessed in experience sampling studies than the task used in our previous study. Also, in this study we were able to standardise the emotional stimuli that participants were presented with, which too had not been the case in the previous study either.

However, even though the similar results can be seen as a sign that the new research paradigm for emotion differentiation measures the same construct as experience sampling, it will be important for future validation research to establish that emotion differentiation derived from the task presented here closely relates to emotion differentiation derived from experience sampling in one and the same study. In addition, it would be useful to examine how this task relates to other measures that also have been used to assess emotion differentiation, such as the Levels of Emotional Awareness Scale (Lane, Quinlan, Schwartz, Walker, & Zeitlin, 1990) or the Scenario Rating Task (Schimmack & Diener, 1997) which was recently used by Boden et al. (2013). It should be kept in mind though that none of the lab measures of emotion differentiation will capture the exact similar concept as experience sampling because they are less ecologically valid, and they are measured in a shorter period of time (a single lab session compared to one or two weeks of experience sampling). However, due to their controllability, lab measures have other advantages which allow to control or correct for other factors that may (indirectly) affect the level of emotion differentiation, such as individual differences in situation selection.

## GENERAL DISCUSSION

The tendency to differentiate between negative emotions in one's own experience has recently been heralded as an important indicator of healthy emotional functioning and regulation. While based on reported subjective experience, it should be distinguished from typical self-report measures as it is indirectly inferred from multiple measurements and therefore not contaminated by self-representational concerns and other biases. Negative emotion differentiation could therefore convey unique information about the emotional functioning of individuals. Yet, very little was known about the characteristics of people who are high or low in negative emotion differentiation.

In the current studies, we explored how individual differences in negative emotion differentiation are related to fundamental dimensions of

[2] As an attempt to verify this interpretation, we examined whether the relationship between the approach scale and the negative emotion differentiation index was still significant after controlling for the alexithymia-DIF scale by conducting a partial correlation analysis. Results showed that the relationship between negative emotion differentiation and the approach scale was unchanged after controlling for the DIF scale ($r = .29$, $p < .001$), indicating that the relationship between negative emotion differentiation and the approach scale exists independently of the DIF scale.

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personality. Our findings revealed that negative emotion differentiation was consistently negatively related to neuroticism, and not related to any of the other five-factor personality dimensions. Although extraversion is also considered to be involved in emotional processing (Robinson, 2007), it relates specifically to positive emotionality, which we did not examine in the current studies. The fact that the trait openness to experience, which appears to be related to intelligence (Aitken Harris, 2004), did not relate to negative emotion differentiation suggests that the extent in which individuals differentiate between emotions may be distinct from intellect or curiosity towards emotions. The consistent relationship with neuroticism also indicates that negative emotion differentiation bears on a person's well-being.

With regard to this, we next showed that negative emotion differentiation is consistently related to various forms of well-being. First, we found that negative emotion differentiation was related to a lower intensity of experienced negative emotions and to trait self-esteem. Secondly, we replicated the association between reduced negative emotion differentiation and depression recently reported by Demiralp et al. (2012), using a non-clinical sample. First of all, this validates the novel method proposed to measure emotion differentiation. These findings further emphasise that high levels of negative emotion differentiation reflect healthy psychological functioning, and that the low levels of negative emotion differentiation are associated with indicators of psychological ill-health. Furthermore, we found that people who display high levels of negative emotion differentiation score low on measures of alexithymia and vice versa. This finding is important because it links two partially overlapping constructs that have previously been examined in isolation. Yet, the obtained associations were not sufficiently high to conclude that the two constructs measure the same phenomena. This seems to be in line with a recent study on the relationship between emotion differentiation and emotional clarity, a construct which also shows great conceptual overlap with alexithymia (Palmieri, Boden, & Berenbaum, 2009), and in which no significant relationship was found between the two constructs (Boden et al., 2013).

We hypothesised that negative emotion differentiation relates to well-being because it reflects knowledge about the specific antecedents and consequences involved in our emotional life, and the ability to apply this knowledge in emotional situations, leading to differentiated and adaptive emotional responding and regulation. For this to take place, we hypothesised that people should be motivated to examine their emotions.

On the one hand, we indeed demonstrated that low negative emotion differentiation is related to a higher motivation to avoid emotional situations and experiences. This finding is in line with research on depression, which shows that a desire to avoid intense negative emotions lies at the base of over-generalised autobiographical memory, a key phenomenon in depression (e.g., Hermans et al., 2005; Kuyken & Dalgleish, 1995). On the other hand though, low negative emotion differentiation was also related to an approach motivation towards emotions, while the approach and avoidance motivation scales were unrelated to each other. One plausible explanation might be that some individuals who are low on negative emotion differentiation are actually aware of the fact that they lack knowledge about their emotions, which may lead them to adopt an approach motivation towards emotions in the hope that by approaching them, they might understand them better. However, this explanation is speculative, and future research might hopefully shed more light on it.

To sum up, based on our findings we suggest that a person's level of negative emotion differentiation seems to depend on whether s/he *wants* to differentiate between negative emotions (as reflected in the motivation to approach emotions). Experimental research is needed, however, to establish a causal nature of this relation with negative emotion differentiation (e.g., by manipulating the motivation to approach or avoid one's emotions). However, this is only one factor that may influence the level of negative emotion differentiation, and future research should also be directed towards uncovering other possible factors such as capacity-bound factors (e.g., emotional

working-memory capacity) that may influence whether an individual has the capacity to differentiate on the one hand, and an individual's verbal intelligence or even the processes through which an individual has acquired his/her emotion knowledge (e.g., Widen & Russell, 2004) on the other hand.

Apart from its correlational nature, the reported research is limited in the sense that it relied mostly on self-report questionnaires. It is important to point out, however, that although participants are asked to self-report their emotions, a measure of emotion differentiation is obtained indirectly by calculating the ICC between emotion ratings. In other words, participants are not directly asked to indicate how well they differentiate between emotions, nor can they easily manipulate their scores indicating emotion differentiation. A final limitation concerns the fact that the studies were all conducted with student samples. It is therefore recommended to replicate the current findings in different populations.

In terms of future directions, research on emotion differentiation has exclusively been focused on the extent in which individuals differentiate between emotions, distinguishing between people who differentiate a lot and others who tend to experience emotions more globally. An interesting avenue for future research would be to complement such research with studies that also look at the ways people differ in how they differentiate between emotions, and how this relates to well-being. More specifically, it would be interesting to investigate whether people differentiate equally between all emotions, or whether some emotions seem more similar to each other than others. We already know that individuals differ in how they structure their affective universe (Feldman, 1995). Yet many questions remain, especially in terms of what such differences look like. In other words, where research is now focused on the quantity, in the future this focus could be complemented with studies examining the quality of emotion differentiation.

Our findings aim to contribute to research on negative emotion differentiation in a number of ways. First, we situated negative emotion differentiation more broadly in relation to well-established dimensions of individual differences, thus helping to create a proper nomological network for this construct. Secondly, we found support for the notion that negative emotion differentiation is related to well-being, extending this to documenting relations with emotional intensity, self-esteem, depression symptoms (in a non-clinical sample) and dimensions of alexithymia. Thirdly, we suggest a possible determinant of negative emotion differentiation in terms of the motivation (approach/avoidance of emotions) to differentiate between emotions, which may potentially underlie individual differences in negative emotion differentiation. Finally, our research showed that emotion differentiation can also be effectively measured in the lab. The fact that we obtained similar results using lab and experience sampling methods adds to the robustness of our findings.

Manuscript received 22 May 2013
Revised manuscript received 10 December 2013
Manuscript accepted 11 December 2013
First published online 10 January 2014

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