



The Multidimensional Emotion Questionnaire (MEQ): Rationale and Initial Psychometric Properties

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Abstract

Emotion research would benefit from a self-report measure that assesses both discrete emotions and broad dimensions, takes into account the time-course of emotional experience, and distinguishes emotional reactivity and regulation. The present study describes the development and psychometric properties of the Multidimensional Emotion Questionnaire (MEQ), which was designed to address these needs. The MEQ assesses: (a) two superordinate dimensions of emotional reactivity (positive and negative), (b) three components of positive and negative emotional reactivity (frequency, intensity, and persistence), and (c) 10 discrete emotions (5 positive: happy, excited, enthusiastic, proud, inspired; 5 negative: sad, afraid, angry, ashamed, anxious). In addition, the MEQ assesses the ability to regulate these emotions. To investigate its psychometric properties, the MEQ was administered to a diverse sample of 309 United States adults (Study 1) along with established measures of emotional experience and regulation. The MEQ was also administered to a sample of 168 undergraduates (Study 2) to examine 3-week test-retest reliability. Results generally support the reliability and validity of the MEQ. Specifically, internal consistencies for all scales range from acceptable to excellent, confirmatory factor analyses support the hypothesized structure, and, with few exceptions, items exhibit hypothesized loadings, and scales exhibit hypothesized associations with each other and with other measures of emotional experience and regulation. In addition, the MEQ demonstrates strong test-retest reliability. The MEQ is likely to be of use to researchers interested in a detailed, reliable, and valid assessment of emotional experience.

Keywords Emotion · Assessment · Measurement · Multidimensional emotion questionnaire · MEQ

Understanding emotion is necessary for understanding human nature. For this reason emotion is a key construct in diverse psychological fields including personality (John and Gross 2004), developmental psychology (Campos et al. 1989;

Camras and Shuster 2013), social psychology (Parkinson and Manstead 2015), and neuroscience (Davidson et al. 2000), among others. Clinical psychologists have a particular interest in utilizing knowledge about emotion to explain the origins and persistence of diverse psychological disorders (Tracy et al. 2014). For example, researchers have proposed emotion dysregulation theories of anxiety (Mennin et al. 2005), borderline personality disorder (Glenn and Klonsky 2009), depression (Gross and Munoz 1995), and non-suicidal self-injury (Klonsky 2007, 2009). Progress in all of these fields relies on accurate and comprehensive assessment of emotional experience.

Advances in emotion measurement have included the development of several physiological methods that hold promise for more objective and biologically-informed emotional assessment (e.g., Hajcak et al. 2006; Vrana et al. 1988; Weinberg et al. 2009). However, the field relies and will continue to rely heavily on self-report questionnaires given their ease of use and strong psychometric properties. As an example of the importance and pervasiveness of such emotion measures, one self-report questionnaire, the Positive and Negative Affect Schedule (PANAS; Watson et al. 1988), has been cited

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in more than 30,000 scholarly publications according to Google Scholar. Despite their many strengths and widespread use, existing self-report measures have three important limitations: failure to consider the time-course of emotional experience, inadequate assessment of discrete emotions, and difficulties differentiating emotion reactivity from regulation.

Affective Chronometry

The first limitation of existing self-report measures is that they tend to assess a single dimension of emotional experience (e.g., intensity or frequency). Most extant measures fail to differentiate *components* of emotional responses, even though it is well-established that emotional responses consist of several components, including sensitivity/threshold for a response, intensity of the response, and persistence of the response (Davidson 1998; Rothbart and Derryberry 1981). These components have been collectively referred to in terms of *affective chronometry* (Davidson 1998; Rothbart and Derryberry 1981). Threshold or sensitivity refers to the strength of an event or stimulus required to elicit an emotional response, and will determine how frequently an emotional response is triggered. Intensity refers to the strength of the emotional response when it occurs. Persistence refers to how long the emotional response lasts before recovery to baseline. Any given emotional experience depends on all three of these components (see Fig. 1 from Tracy et al. 2014)

Notably, traditional self-report measures of emotional experience do not assess these affective chronometric components. For example, the PANAS (Watson et al. 1988) instructs participants to rate the “extent you have felt” each emotion. This type of rating implicitly requires participants to aggregate the frequency, intensity, and persistence of their emotional experience into a single rating, and may miss important information. Consider someone who occasionally experiences very intense and persistent anger, compared to someone who experiences mild anger several times a day, every day. Both may be inclined to rate their “extent” of anger as being high, but their emotional experiences differ in important ways. A more complete and precise account of emotional experience requires individually assessing all three components: a) how often one feels anger (frequency), b) how strong or powerful one’s anger response tends to be (intensity), and c) how long one tends to remain angry (persistence).

To date, three self-report emotion measure has been developed with the aim of distinguishing these different aspects of emotional experience. One is the Multidimensional Emotion Questionnaire (MEQ), which is the subject of this paper. The MEQ separately assesses the frequency, intensity, and persistence of emotions, and an initial version of the MEQ has been used to characterize emotional experience in clinical populations with self-injury (Victor and Klonsky 2014) and

borderline personality disorder (Chu et al. 2016). The initial version of the MEQ was not subjected to formal psychometric validation, and participant feedback suggested that the response choices for some items were vague and therefore difficult interpret and rate. Consequently, response choices were rewritten to be more specific and objective. For example, the frequency of an emotion was originally indicated by options such as “*Almost Never*” or “*Often*”, but is now indicated by options such as “*About once per month or less*” or “*2 or 3 times each day*”. Similarly, the persistence/duration of an emotion was originally indicated by options such as “*Short*” or “*Very Long*”, but is now indicated by options such as “*Less than 1 minute*” and “*Longer than 4 hours*”. This updated version supersedes the initial version of the MEQ, and is the focus of the present article.

Two other measures have also sought to address affective chronometry. The Emotion Reactivity Scale (ERS; Nock et al. 2008) was designed to assess negative emotional reactivity, and includes eight items assessing sensitivity (similar to frequency, e.g., “I often feel extremely anxious”), ten items assessing intensity (e.g., “When I experience emotions, I feel them very strongly/intensely”), and three items assessing persistence (e.g., “When I am angry/upset, it takes me much longer than most people to calm down”). As an overall measure of negative emotional reactivity, the ERS displays excellent reliability and validity (Nock et al. 2008). However, correlational and factor analyses suggest that the ERS does not sufficiently differentiate sensitivity, intensity, and persistence, and, instead, is best represented by a single factor (Nock et al. 2008). In addition, the ERS was designed as a measure of negative emotional reactivity (e.g., “upset”, “hurt”, “angry”), and does not includes items to address positive emotional reactivity. Thus, there remains a need for a measure of both positive and negative emotions that can capture distinct components of emotional experience.

Most recently, Ripper et al. (2018) developed the Emotional Reactivity Intensity and Perseveration Scale (ERIPS). The ERIPS assesses reactivity, intensity, and perseveration of both positive and negative emotions, and is thus closely aligned with the MEQ’s goal of distinguishing components of affective chronometry. The MEQ differs from the ERIPS in a few ways. One is that the MEQ includes some emotions that are not included on the ERIPS (e.g., “happy”). A second is that the MEQ uses more specific response options. For example, the MEQ assesses persistence of an emotion with response options indicating specific time frames such as “1–10 min” and “longer than 4 hours”, whereas the ERIPS assesses persistence with response options such as “slightly persistent” and “very persistent”. Finally, unlike the ERIPS, the MEQ assesses regulation of each emotion in addition to reactivity. Thus, the ERIPS and MEQ approach the self-report of emotion and affective chronometry in slightly different ways.

Discrete Emotions

A second limitation of traditional self-report emotion measures is that they do not provide reliable and valid assessment of discrete emotions. Whereas many in the field recognize the validity and importance of discrete emotions such as happy, sad, afraid, and angry (Ekman 1999; Izard 1994, 2007; Panksepp 2007), existing self-report measures tend to treat ratings of discrete emotions as indicators of broad dimensions rather than important constructs in and of themselves. For example, items on the ERS (Nock et al. 2008) relevant to individual negative emotions such as anger, fear, and sadness are aggregated into an overall reactivity scale. By design, the measure does not provide indices of reactivity for individual discrete emotions.

Similarly, the PANAS (Watson et al. 1988) has excellent psychometric properties and is a common measure for those who desire to assess the broad dimensions of positive and negative emotionality. The expanded, 60-item version of the PANAS also includes scales assessing 11 specific emotional states: fear, sadness, guilt, hostility, shyness, fatigue, surprise, joviality, self-assurance, attentiveness, and serenity (Watson and Clark 1994). However, as noted above, PANAS items do not assess components of affective chronometry. It is therefore unclear whether participants' responses to PANAS items are driven by the frequency, intensity, and/or persistence of their emotions. Moreover, the original version of the PANAS utilizes single items for individual emotions such as sad, afraid, angry, cheerful, and calm. These ratings are aggregated into one negative-affect scale and one positive-affect scale, which does not permit reliable and valid assessment of individual emotions. The ERIPS (Ripper et al. 2018) assesses reactivity, intensity, and perseveration for each of the emotion items on the original version of the PANAS, thereby permitting a multi-item measure of each emotion. However, as will be discussed further below, the ERIPS, PANAS, and ERS do not assess individuals' abilities to regulate emotions.

Other measures have been developed to assess an individual emotion such as happiness (Lyubomirsky and Lepper 1999), anger (Snell et al. 1995), and anxiety (Spielberger et al. 1970). These scales can be quite useful; however, each focuses on just a single emotion, and none are designed to distinguish affective chronometric components. Assessing a range of individual emotions would require using each of these scales, which could quickly become impractical given constraints on participant time and effort. Therefore, the field would benefit from an omnibus emotion questionnaire that provides valid indices of key discrete emotions – such as happy, sad, afraid, and angry – including their affective chronometric components.

Differentiating Emotion Regulation from Emotional Reactivity

A third limitation of existing self-report measures is that they do not distinguish emotional reactivity from emotion regulation. For our purposes, emotion regulation refers to conscious efforts to decrease or increase emotional experience (Cole et al. 2004; Gross 2002) (although we recognize that different definitions of emotion regulation have been postulated, and some researchers question whether emotion regulation and reactivity can be distinguished conceptually or empirically; see Bridges et al. 2004 and Zelkowitz and Cole 2016). Neither the PANAS (Watson et al. 1988) nor the ERS (Nock et al. 2008) assess regulation. In fact, no self-report measure has been designed to assess both emotional reactivity and regulation.

However, three measures that index emotion regulation (but not reactivity) deserve note. The Difficulties in Emotion Regulation Scale (DERS; Gratz and Roemer 2004) has been an influential measure of emotion regulation during the past decade. The DERS assesses six different types of emotion regulation difficulties, such as poor emotional clarity and difficulty generating regulation strategies. As of this writing, the DERS has been cited in more than 4000 scholarly publications according to Google Scholar, and has been validated for use with both adults (Gratz and Roemer 2004) and adolescents (Weinberg and Klonsky 2009). In addition, the popularity of the DERS has led to the development of several brief versions (Bjureberg et al. 2016; Kaufman et al. 2016; Victor and Klonsky 2016). However, there are three ways in which the DERS could be improved upon. First, the DERS does not differentiate between emotional reactivity and emotion regulation. Consider the following DERS item meant to assess the ability to formulate strategies for regulating emotion: “When I’m upset, I know that I can find a way to eventually feel better.” Low endorsement of this item might indeed reflect difficulties regulating negative emotion, as intended. However, low endorsement could also reflect dimensions of emotional reactivity. For example, someone who experiences high persistence of negative emotion might report that they struggle to find a way to feel better once they are upset. In short, responses to many items on the DERS may be impacted by high emotional frequency, intensity, and/or persistence in addition to the target construct of poor regulation. Second, like the ERS (Nock et al. 2008), the DERS focuses exclusively on negative emotions. For example, the majority of items begin with the stem, “When I’m upset.” Finally, like the ERS, the DERS does not separately index regulation for individual emotions; it addresses regulation of negative emotions in general.

The second regulation measure of note is the Cognitive Emotion Regulation Questionnaire (CERQ, Garnefski et al. 2001; Ireland et al. 2017). The CERQ was designed to assess nine cognitive coping strategies that individuals may use

following negative life events. The CERQ has been cited in over 1000 studies, has both full-length and short versions, and has shown good psychometric properties in a variety of populations. However, like the DERS, the CERQ was not designed to assess emotional reactivity, and it assesses cognitive regulation of negative emotions and experiences broadly conceived, not the regulation of individual emotions.

The third emotion regulation measure of note is the Emotion Regulation Questionnaire (ERQ; Gross and John 2003). The ERQ has been cited in thousands of studies, and is a well-validated measure of two emotion regulation strategies: cognitive reappraisal and suppression. However, the ERQ does not assess how well or how easily individuals can regulate their emotions, just whether they typically utilize these two types of strategies. Furthermore, like the DERS and CERQ, the ERQ does not index emotional reactivity, and takes a broad approach to the assessment of emotion as opposed to an approach that assesses and distinguishes different discrete emotions.

The Multidimensional Emotion Questionnaire: Theoretical Assumptions and Description

This article reports on the development, reliability, and validity of the Multidimensional Emotion Questionnaire (MEQ), a self-report measure developed to address the limitations of the emotion literature described above. Five theoretical premises informed the development of the MEQ. First, emotional experience as described in the English language is best represented by two relatively independent dimensions: positive affect and negative affect. This structure has been supported by numerous studies using numerous methods and samples (Watson & Tellegen, 1985). Second, discrete emotions exist and should be assessed. While we recognize there is some debate, we embrace the perspective of Ekman, Panksepp, Izard and others that there are individual emotions with different emotional, cognitive, behavioral, and biological correlates, causes, and consequences (Ekman 1999; Izard 2007; Panksepp 2007). Third, as discussed earlier, emotions have a time-course (Davidson 1998; Rothbart and Derryberry 1981). Thus an assessment of emotion should address at least frequency, intensity, and duration, and not just one or two of these components. Fourth, emotion regulation is meaningfully different than emotion reactivity. To be sure, the relationship and overlap between emotion reactivity and regulation is complex, various conceptualizations and definitions of these constructs have been offered (Bridges et al. 2004; Zelkowitz and Cole 2016), and no single measure can integrate these perspectives. At the same time, we agree with Cole and Gross and others (Cole et al. 2004; Gross 2002) that emotion regulation differs from emotion reactivity, and warrants

assessment as its own construct. Fifth, we recognize that emotional experience has important aspects in addition to those that are subjectively and consciously perceived. For example, emotions have physiological and motor components (Shuman and Scherer 2014) in addition to subjective feelings ones captured by self-report. All self-report measures of emotion have this inherent limitation, and the MEQ is no different.

With these theoretical premises in mind, the MEQ was designed to provide an enhanced approach to the self-report assessment of emotion. Specifically, we aimed to develop a measure that assesses: a) both discrete emotions and superordinate dimensions of negative and positive emotionality, b) components of emotional reactivity derived from an affective chronometry perspective, and c) emotion regulation as distinct from emotional reactivity. Thus, the MEQ includes scales that assess: two superordinate dimensions of emotional reactivity (positive and negative), 10 discrete emotions (five positive and five negative), three subcomponents of positive and negative emotional reactivity (frequency, intensity, and persistence), and the regulation of both positive and negative emotions. We recognize the long-standing and well-documented challenges involved in distinguishing among components of reactivity and regulation (Cole et al. 2004; Zelkowitz et al. 2016). Thus, we do not expect the MEQ to solve this issue; rather our aim is to offer a self-report method that allows for the *possibility* of distinguishing these components. In turn, this measure allows for future studies to investigate the extent to which self-report responses can make these distinctions for different types of emotion (e.g., negative vs. positive; different discrete emotions) and in various populations (e.g., younger vs. older; clinical vs. community).

In the present series of studies we investigated the psychometric properties of the MEQ. Specifically, in a diverse sample of United States adults we examined structural validity, internal consistency, and convergent and divergent validity. In addition, in a university sample we investigated test-retest reliability.

Study 1: Structural, Convergent, and Divergent Validity

We first administered the MEQ to a large sample of adults from the United States. Structural validity was evaluated through a confirmatory factor analysis (CFA). In addition, traditional psychometric analyses (exploratory factor analysis, reliability analyses) and tests of construct validity were conducted on the MEQ scales.

Regarding reliability and structure, we hypothesized that:

- 1) CFA will support the proposed structure of the MEQ (more detail on proposed structure in Measures section below);

- 2) MEQ discrete emotions scales will display adequate or better internal consistency;
- 3) MEQ emotion reactivity scales will display adequate or better internal consistency;
- 4) MEQ overall positive and negative emotion reactivity scales will exhibit a negative but small inter-correlation with each other;

Regarding construct validity, we hypothesized that:

- 5) MEQ positive and negative regulation scales will robustly predict emotion regulation difficulties (as indexed by the Difficulties in Emotion Regulation Scale), and continue to predict emotion regulation difficulties over and above the MEQ negative and positive reactivity scales;
- 6) MEQ overall negative and positive emotion reactivity scales will correlate strongly and positively with corresponding PANAS scales, but moderately and negatively with the non-corresponding PANAS scales;
- 7) MEQ and PANAS discrete emotions scales will exhibit strong convergence between theoretically similar scales (i.e., MEQ Happy-PANAS Joviality, MEQ Enthusiastic-PANAS Joviality, MEQ Sad-PANAS Sadness, MEQ Afraid-PANAS Fear, MEQ Angry-PANAS Hostility, MEQ Anxious-PANAS Fear, MEQ Ashamed-PANAS guilt, MEQ Proud-PANAS Self-Assurance); and
- 8) MEQ overall negative but not positive emotion reactivity will correlate negatively with age; age is utilized as a criterion for examining predictive validity because research has established an inverse relationship between age and negative emotionality but not positive emotionality (Charles et al. 2001).

Methods

Participants and Procedure

Data were collected from 309 adults in the United States via Amazon's Mechanical Turk website (Buhrmester et al. 2011). Participants recruited through Mechanical Turk comprise a sociodemographically diverse sample suitable for investigations of psychological constructs that show meaningful variation in normative populations (Buhrmester et al. 2011). The sampled obtained was 55.4% female, 75.7% Caucasian, 7.4% African American, 3.2% East Asian, 2.3% Latin American, 2.3% South Asian, 1.6% Native American, and 7.4% selected the category of "other". Mean age was 35.9 ($SD = 13.0$). Ethics approval for data collection via Mechanical Turk was obtained through the University of British Columbia.

Measures

The Multidimensional Emotion Questionnaire (MEQ) The MEQ was developed for, and is the focus of, this study. The MEQ assesses five positive (happy, excited, enthusiastic, proud, and inspired) and five negative emotions (sad, afraid, angry, ashamed, and anxious). These emotions were chosen because they are included in the PANAS-X (Watson et al. 1988) and because they are consistent with accounts of emotions important to human emotional experience (Ekman 1999; Izard 1994; Izard 2007; Panksepp 2007). The one exception is that "anxious" is not included on the PANAS-X, though it is reflected in the PANAS-X Fear scale which correlates very highly with anxiety (Watson and Clark 1994), and is an important emotion in clinical contexts (Mennin et al. 2005). The instructions for the MEQ are as follows:

"This questionnaire asks about your experience of different emotions such as sad, happy, and afraid. We are interested in assessing four different parts of each emotion. Specifically, for each emotion, you will be asked to rate:

- 1) how *often* you experience the emotion;
- 2) how *intense* the emotion typically is when it occurs;
- 3) how *long-lasting* the emotion typically is when it occurs;
- 4) how well you can *regulate* the emotion when it occurs (i.e., how well you can reduce or increase the emotion)."

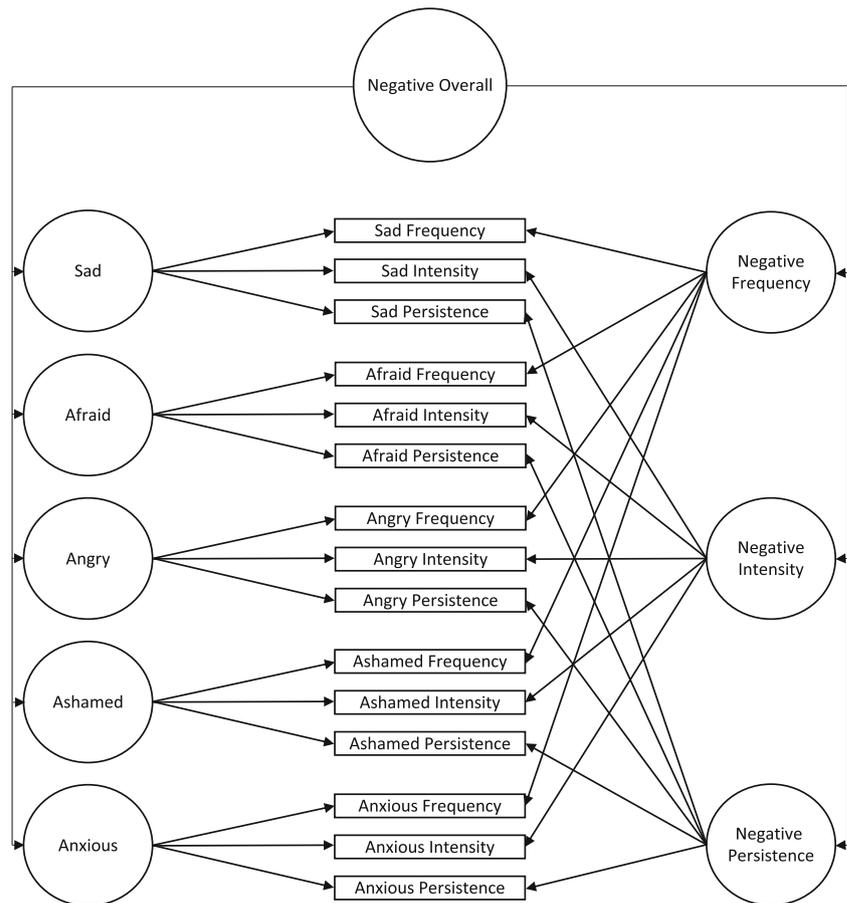
The response choices for each question are as follows: 1) How Often (about once each month, about once each week, about once each day, about 2–3 times each day, more than 3 times each day), 2) How Intense (very low, low, moderate, high, very high), 3) How Long-Lasting (less than one minute, 1–10 min, 11–60 min, 1–4 h, longer than four hours), and 4) How Easy To Regulate (very easy, easy, moderate, difficult, very difficult). The instructions for the MEQ include two examples to help participants understand and rate these domains (see Appendix).

The MEQ yields four types of emotion scales: 1) 10 discrete emotions scales (see above), 2) two superordinate dimensions of emotionality reactivity (positive and negative), 3) three subcomponents of emotional reactivity (frequency, intensity, and persistence), and 4) regulation.

Regarding discrete emotion scales, separate MEQ scales are computed for the 10 discrete emotions. For each emotion, scores for the frequency, intensity, and persistence items are summed to form a single score. For example, the "Happy" discrete emotion scale score is the sum of the items that index the frequency, intensity, and persistence of the emotion happy.

Regarding superordinate positive and negative emotionality scales, frequency, intensity, and persistence scores for positive emotions are summed to form an overall positive emotional reactivity score, and frequency, intensity, and persistence scores for negative emotions are summed to form an overall negative emotional reactivity score.

Fig. 1 Hypothesized structure of MEQ negative emotions



Regarding subcomponents of emotional reactivity, MEQ scales are calculated for positive frequency, positive intensity, positive persistence, negative frequency, negative intensity, and negative persistence by summing scores for the relevant items. For example, the positive intensity subscale is formed by summing the intensity scores for happy, excited, enthusiastic, proud, and inspired, and the positive persistence subscale is formed by summing persistence scores for happy, excited, enthusiastic, proud, and inspired.

Finally, regarding regulation, MEQ scales were calculated for positive emotion regulation and negative emotion regulation by summing scores for the relevant items. For example, the positive regulation subscale is formed by summing regulation scores for happy, excited, enthusiastic, proud, and inspired.

The Positive and Negative Affect Schedule (Expanded Form)

The PANAS-X (Watson et al. 1988) is a 60-item self-report measure of emotion with excellent reliability and validity. The PANAS-X includes general scales of negative and positive affect, as well as 11 basic emotions scales: fear, hostility, guilt, sadness, joviality, self-assurance, attentiveness, shyness, fatigue, serenity, and surprise. For the trait version, which was utilized in the present study, respondents are asked to rate each

item regarding the extent to which they have felt that way “in general.” Items are rated on a 5-point scale ranging from “very slightly or not at all” to “extremely.” For the present study, the PANAS-X scales were used to examine the convergent and divergent validity of the MEQ overall positive and negative reactivity scales as well as the discrete emotions scales.

Difficulties in Emotion Regulation Scale (DERS) The Difficulties in Emotion Regulation Scale (DERS; Gratz and Roemer 2004), a 36-item, six-scale self-report measure with established reliability and validity. The DERS assesses clinically relevant difficulties in emotion regulation, and was utilized in the present study to examine the validity of the MEQ regulation scales. Participants indicate on a Likert scale how often each item applies to themselves, with responses ranging from 1 (almost never) to 5 (almost always). Higher scores indicate greater difficulty with emotion regulation.

Results

Structural Validity

The hypothesized structure of MEQ items is somewhat unique in that each item indicates two different types of underlying

constructs: 1) discrete emotions and 2) emotion reactivity components. In turn, the latent discrete emotions and the latent reactivity dimensions are modeled as indicators of overall emotional reactivity. This structure is illustrated in Figs. 1 and 2. Note in the figures that each of the MEQ items, represented by the rectangles, serves as an indicator for both a latent discrete emotion and a latent reactivity component. For example, in Fig. 1, the item assessing frequency of sadness (“Sad Frequency”) contributes to both the Sad scale (to the left of the item) and to the Negative Frequency scale (to the right of the item). Because we embrace the view of Cole and Gross and others (Cole et al. 2004; Gross 2002) that emotion regulation differs from emotion reactivity, we do not include the emotion regulation items in the structural models..

The fit of this hypothesized structure was evaluated through CFA. For comparison purposes, we also examined the fit of two simpler models, one in which items only indicate discrete emotions but not emotion reactivity components, and one in which items only indicate emotion reactivity components but not discrete emotions.

First, we examined fit for MEQ items indexing the negative emotions scales (Fig. 1). The results of the CFA indicated very

good fit, $X^2_{68} = 108.6, p < .01, CFI = .980, RMSEA = .044$. Notably, inferior fit was observed for a model in which the items only indicated the five negative discrete emotions ($CFI = .856, RMSEA = .116$) or only indicated the three negative reactivity components ($CFI = .687, RMSEA = .170$). Loadings are presented in Table 1. All loadings were predicted to be positive. Of the 38 loadings estimated: 32 exhibited statistically reliable ($p < .05$) values in the positive direction, zero exhibited statistically reliable values in the negative direction, and four were not statistically differentiable from 0 (the five item loadings on negative intensity, and the loading of negative persistence on overall negative).

Second, we examined fit for MEQ items indexing the positive emotions scales (Fig. 2). The results of the CFA indicated excellent fit, $X^2_{68} = 100.6, p < .01, CFI = .982, RMSEA = .039$. Notably, inferior fit was observed for a model in which items only indicated the five positive discrete emotions ($CFI = .810, RMSEA = .114$) or only indicated the three positive reactivity components ($CFI = .643, RMSEA = .155$). Loadings are presented in Table 2. All loadings were predicted to be positive. Of the 38 loadings estimated: 34 exhibited statistically reliable ($p < .05$) values in the positive direction, zero exhibited statistically reliable values

Fig. 2 Hypothesized structure of MEQ positive emotions

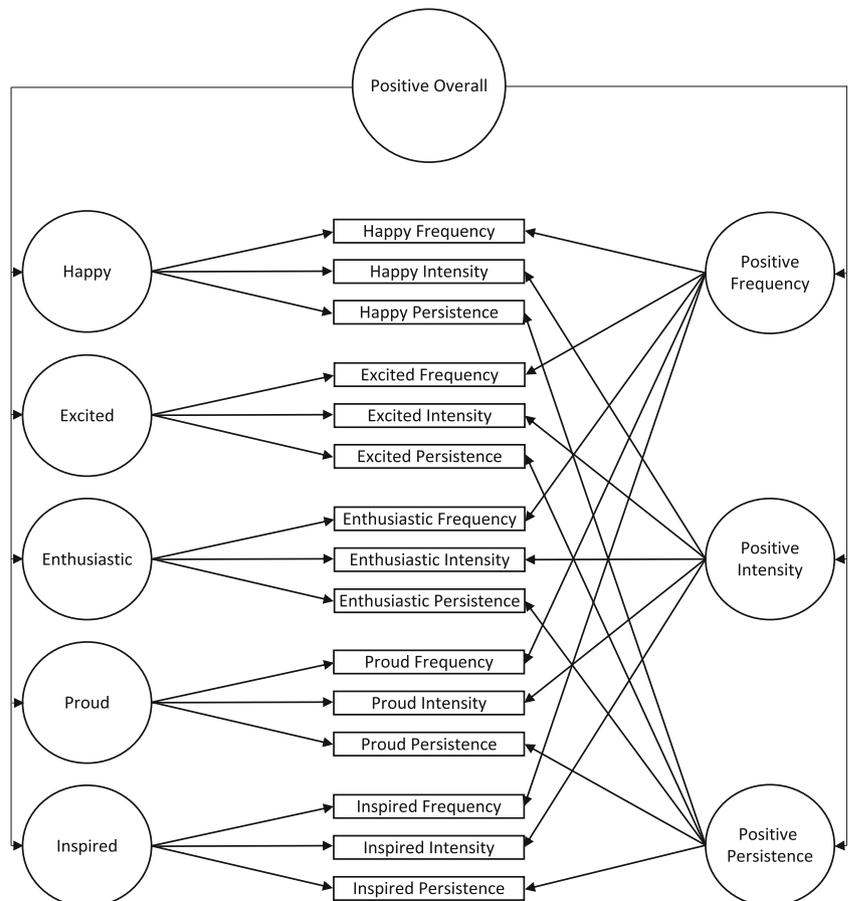


Table 1 Confirmatory factor analysis standardized loadings: negative emotion

| Discrete Scales | | | | | Item | Reactivity Scales | | |
|--------------------------------|---------|-------|--------|-----|---------------------|--------------------|--------------------|----------------------|
| Anxious | Ashamed | Angry | Afraid | Sad | | Negative Frequency | Negative Intensity | Negative Persistence |
| | | | | .43 | Sad Frequency | .55 | | |
| | | | | .92 | Sad Intensity | | -.23 | |
| | | | | .63 | Sad Persistence | | | .32 |
| | | | .48 | | Afraid Frequency | .49 | | |
| | | | .91 | | Afraid Intensity | | .05 | |
| | | | .80 | | Afraid Persistence | | | .36 |
| | | .39 | | | Angry Frequency | .38 | | |
| | | .95 | | | Angry Intensity | | -.21 | |
| | | .64 | | | Angry Persistence | | | .48 |
| | .60 | | | | Ashamed Frequency | .29 | | |
| | .98 | | | | Ashamed Intensity | | -.10 | |
| | .84 | | | | Ashamed Persistence | | | .30 |
| .61 | | | | | Anxious Frequency | .45 | | |
| .78 | | | | | Anxious Intensity | | .26 | |
| .89 | | | | | Anxious Persistence | | | .37 |
| Overall Negative Emotion Scale | | | | | | | | |
| .65 | .72 | .66 | .73 | .71 | | .41 | .67 | -.31 |

in the negative direction, and four were not statistically differentiable from 0 (happy persistence on happy, happy intensity on positive intensity, excited on overall positive, and enthusiastic on overall positive).

MEQ Discrete Emotion Scales

We next computed internal consistencies, intercorrelations, means and standard deviations for the discrete emotions scales

Table 2 Confirmatory factor analysis standardized loadings: positive emotion

| Discrete Scales | | | | | Item | Reactivity Scales | | |
|--------------------------------|-------|--------------|---------|-------|--------------------------|--------------------|--------------------|----------------------|
| Inspired | Proud | Enthusiastic | Excited | Happy | | Positive Frequency | Positive Intensity | Positive Persistence |
| | | | | .38 | Happy Frequency | .39 | | |
| | | | | .75 | Happy Intensity | | .14 | |
| | | | | .16 | Happy Persistence | | | .61 |
| | | | .21 | | Excited Frequency | .67 | | |
| | | | .72 | | Excited Intensity | | .49 | |
| | | | .44 | | Excited Persistence | | | .50 |
| | | .46 | | | Enthusiastic Frequency | .56 | | |
| | | .54 | | | Enthusiastic Intensity | | .59 | |
| | | .51 | | | Enthusiastic Persistence | | | .58 |
| | .60 | | | | Proud Frequency | .33 | | |
| | .77 | | | | Proud Intensity | | .30 | |
| | .65 | | | | Proud Persistence | | | .30 |
| .53 | | | | | Inspired Frequency | .44 | | |
| .76 | | | | | Inspired Intensity | | .45 | |
| .61 | | | | | Inspired Persistence | | | .32 |
| Overall Positive Emotion Scale | | | | | | | | |
| .47 | .37 | .33 | .19 | .71 | | .67 | .74 | .52 |

Table 3 MEQ Discrete emotions scales: intercorrelations, descriptive statistics, and coefficient alpha

| Scale | Hap | Exc | Ent | Pro | Ins | Sad | Afr | Ang | Ash | Anx | Mean (SD) | Alpha |
|------------------|------|-----|------|------|------|------|------|------|------|------|------------|-------|
| Happy | – | .48 | .53 | .45 | .45 | –.25 | –.20 | –.08 | –.27 | –.24 | 10.2 (2.2) | .62 |
| Excited | | – | .48 | .36 | .42 | –.10 | .04 | .12 | –.02 | .03 | 8.1 (2.2) | .61 |
| Enthusiastic | | | – | .38 | .50 | –.26 | –.07 | –.09 | –.16 | –.10 | 8.3 (2.6) | .76 |
| Proud | | | | – | .35 | –.16 | –.10 | –.02 | –.08 | –.04 | 7.7 (2.7) | .81 |
| Inspired | | | | | – | –.17 | .03 | –.01 | –.04 | .00 | 7.9 (2.8) | .81 |
| Sad | | | | | | – | .50 | .41 | .42 | .47 | 8.3 (2.5) | .67 |
| Afraid | | | | | | | – | .34 | .50 | .53 | 6.1 (2.7) | .79 |
| Angry | | | | | | | | – | .37 | .36 | 7.4 (2.3) | .62 |
| Ashamed | | | | | | | | | – | .41 | 5.4 (2.6) | .84 |
| Anxious | | | | | | | | | | – | 8.0 (3.2) | .85 |
| Overall Positive | .77 | .71 | .78 | .70 | .75 | –.25 | –.08 | –.02 | –.15 | –.09 | 42.3 (9.3) | .79 |
| Overall Negative | –.28 | .02 | –.18 | –.11 | –.05 | .75 | .79 | .64 | .73 | .78 | 35.1 (9.9) | .79 |

Correlations larger than .11 and .14 are statistically significant at alpha levels of .05 and .01, respectively

(see Table 3). Internal consistency (coefficient alpha) for the discrete emotions scales ranged from adequate to excellent, with a low of .61 for “excited,” and a high of .85 for “anxious.” Intercorrelations among positive discrete emotions scales (median = .45; range .35–.53) and among negative discrete emotions scales (median = .42; range .34–.53) were positive and of moderate magnitude. Mean scores ranged from a low of 5.4 (*SD* = 2.7; “ashamed”) to a high of 10.2 (*SD* = 2.2; “happy”). Finally, we computed an overall positive emotions scale by summing the five discrete positive emotions, and an overall negative emotions scale by summing the five discrete negative emotions. Coefficient alpha for both scales was .79. Overall, positive emotions (*M* = 42.3, *SD* = 9.3) were endorsed more strongly than negative emotions (*M* = 35.1, *SD* = 9.9), [*t*(311) = 8.62, *p* < .001]. As expected, the two scales exhibited a small negative correlation (*r* = –.16, *p* < .01).

MEQ Emotion Reactivity Scales

We next computed internal consistencies, intercorrelations, means, and standard deviations for the emotion reactivity subscales (see Table 4). Internal consistency for the emotion reactivity subscales ranged from good to very good, with a low of .68 for “negative persistence” and a high of .79 for “negative frequency”. Intercorrelations among positive reactivity scales (median = .62; range .51–.66) and among negative reactivity scales (median = .70; range .49–.71) were positive and of medium/large magnitude. Mean scores are also reported in Table 4, although it is important to note that means for different types of reactivity subscales (i.e., frequency vs. intensity vs. persistence) are not directly comparable because the scale anchors had different labels to reflect subscale content (i.e., “about once per month or less” to “more than 3 times

Table 4 MEQ Reactivity and regulation scales: intercorrelations, descriptive statistics, and coefficient alpha

| Scale | PF | PI | PP | NF | NI | NP | PR | NR | Mean (SD) | Alpha |
|----------------------|----|-----|-----|------|------|------|------|------|------------|-------|
| Positive Frequency | – | .66 | .52 | –.16 | –.16 | –.25 | –.05 | –.27 | 13.7 (3.9) | .75 |
| Positive Intensity | | – | .62 | –.16 | .08 | –.04 | .12 | –.03 | 14.8 (3.5) | .75 |
| Positive Persistence | | | – | –.30 | –.11 | .08 | .12 | –.14 | 13.8 (3.5) | .71 |
| Negative Frequency | | | | – | .70 | .49 | .30 | .55 | 10.5 (4.1) | .79 |
| Negative Intensity | | | | | – | .71 | .38 | .77 | 12.8 (4.0) | .75 |
| Negative Persistence | | | | | | – | .42 | .64 | 11.8 (3.3) | .68 |
| Positive Regulation | | | | | | | – | .48 | 11.9 (3.5) | .76 |
| Negative Regulation | | | | | | | | – | 13.6 (4.5) | .79 |

Correlations larger than .11 and .14 are statistically significant at alpha levels of .05 and .01, respectively

Table 5 Intercorrelations Between MEQ and PANAS Discrete Emotions Scales

| MEQ Scale | | | | | | | | | | |
|----------------|-------|---------|--------------|-------|----------|------|--------|-------|---------|---------|
| PANAS Scale | Happy | Excited | Enthusiastic | Proud | Inspired | Sad | Afraid | Angry | Ashamed | Anxious |
| Joviality | .58 | .47 | .57 | .34 | .48 | -.38 | -.21 | -.15 | -.28 | -.27 |
| Serenity | .56 | .29 | .33 | .25 | .32 | -.40 | -.37 | -.16 | -.26 | -.44 |
| Attentiveness | .40 | .31 | .44 | .32 | .43 | -.26 | -.19 | -.06 | -.26 | -.12 |
| Self-Assurance | .46 | .39 | .43 | .43 | .46 | -.29 | -.21 | -.04 | -.21 | -.22 |
| Surprise | .20 | .31 | .26 | .19 | .29 | -.16 | .00 | .04 | -.02 | .02 |
| Sadness | -.44 | -.20 | -.39 | -.25 | -.25 | .64 | .44 | .31 | .44 | .47 |
| Fear | -.31 | -.05 | -.20 | -.15 | -.08 | .43 | .63 | .32 | .44 | .58 |
| Hostility | -.32 | -.03 | -.24 | -.19 | -.14 | .44 | .44 | .53 | .47 | .46 |
| Guilt | -.37 | -.15 | -.30 | -.22 | -.20 | .47 | .48 | .40 | .66 | .47 |
| Shyness | -.29 | -.05 | -.27 | -.19 | -.17 | .28 | .34 | .16 | .35 | .35 |
| Fatigue | -.27 | -.04 | -.27 | -.13 | -.20 | .46 | .33 | .35 | .32 | .41 |

Correlations larger than .11 and .14 are statistically significant at alpha levels of .05 and .01, respectively

each day” for frequency; “very low” to “very high” for intensity; “very short” to “very long” for persistence).

MEQ Emotion Regulation Scales

Internal consistencies for the positive regulation (.76) and negative regulation (.79) scales were good (see Table 4). Both the positive and negative regulation scales were positively correlated with overall negative reactivity (.42 and .75, respectively, $ps < .001$), indicating that greater difficulty in regulating either positive or negative emotions was associated with higher scores on negative emotional reactivity. The negative regulation scale was negatively correlated with overall positive reactivity ($-.18, p < .01$), indicating that a greater ability to regulate negative emotions was associated with higher scores on positive emotional reactivity. Interestingly, positive regulation was not correlated with positive reactivity (.07, $p = .22$). Negative regulation scores ($M = 13.6, SD = 4.5$) were significantly higher than positive regulation scores ($M = 11.9, SD = 3.5$), [$t(308) = 7.2, p < .001$], indicating that participants rated negative emotions as more difficult to regulate than positive emotions.

As a test of convergent validity, we computed correlations between the regulation scales and difficulties in emotion regulation (as indexed by the DERS). Both scales exhibited moderate associations with the DERS: $r = .42$ ($p < .001$) for negative regulation, and $r = .31$ ($p < .001$) for positive regulation. As a test of incremental validity, linear regressions were used to determine if MEQ regulation scales predicted DERS scores over and above MEQ reactivity scales. As hypothesized, MEQ positive regulation predicted DERS scores even when controlling for both overall negative and positive reactivity ($t = 3.27, p = .001$). However, MEQ negative regulation did not predict DERS scores when controlling for both overall negative and positive reactivity ($t = -.39, p = .70$).

Convergent and Divergent Validity with PANAS-X and Age

Three additional sets of analyses were conducted to evaluate the convergent and divergent validity of the MEQ. First, we

examined the correlation of the MEQ overall negative and positive reactivity scales with the PANAS-X negative and positive affectivity scales. As hypothesized, MEQ overall negative reactivity exhibited a strong correlation with PANAS-X negative affectivity ($r = .69, p < .001$), and MEQ overall positive reactivity exhibited a strong correlation with PANAS-X positive affectivity ($r = .72, p < .001$). Also as hypothesized, MEQ overall negative reactivity exhibited a small negative correlation with PANAS-X positive affectivity $r = -.28, p < .001$), and MEQ overall positive reactivity exhibited a small negative correlation with PANAS-X negative reactivity ($r = -.20, p < .001$).

Second, we examined correlations between the MEQ and PANAS-X discrete emotions scales. Based on theoretical similarity and item content, we expected to find especially strong convergence between the following pairs of theoretically similar scales: MEQ Happy-PANAS-X Joviality, MEQ Enthusiastic-PANAS-X Joviality, MEQ Sad-PANAS-X Sadness, MEQ Afraid-PANAS-X Fear, MEQ Angry-PANAS-X Hostility, MEQ Anxious-PANAS-X Fear, MEQ Ashamed-PANAS-X guilt, MEQ Proud-PANAS-X Self-Assurance. Complete results are presented in Table 5. As hypothesized, correlations between theoretically similar MEQ and PANAS scales were robust ranging from .43 to .66. Other, non-hypothesized correlations between MEQ and PANAS-X discrete emotions scales tended to be smaller in magnitude, with a median of .10. As a more stringent test of these hypotheses, for each of the hypothesized correlations between an MEQ scale and a PANAS-X scale, we compared the magnitude of the observed correlation to the median value of the other correlations for that MEQ scale. For example, for the hypothesized association between MEQ Happy and PANAS-X-Joviality, we compared the observed .58 correlation between these variables to the median correlation between MEQ Happy and the other PANAS-X scales, which in this case was |.37| for PANAS-X-Guilt. We repeated this procedure for each of the eight hypothesized correlations noted above; in all cases, the hypothesized correlation was reliably greater than the comparison median correlations (all $ps < .01$).

Third, we examined the relationship of the MEQ overall positive and negative reactivity scales to age because older age is

associated with decreases in negative emotions (Charles et al. 2001). Thus, we hypothesized that MEQ negative reactivity (but not positive reactivity) would exhibit a negative association with age. As expected, age correlated more strongly with MEQ negative reactivity ($r = -.16, p = .005$) than MEQ positive reactivity ($r = .01, p = .92$), ($Z = 1.82, p = .03$).

Discussion

Findings supported the structure, reliability, and validity of MEQ scales. The CFAs showed excellent fit for the hypothesized structure of the MEQ. In addition, the MEQ discrete emotion and emotion reactivity scales exhibited good to excellent internal consistency. Finally, MEQ scales exhibited excellent convergent and divergent validity as evidenced by hypothesized relationships with measures of positive and negative affectivity, emotion dysregulation, and age. An exception to the overall pattern regarded the MEQ negative regulation scale, which did not robustly relate to the DERS, but did not predict DERS scores over and above MEQ overall positive and negative reactivity scales, as had been predicted.

Study 2: Test-Retest Reliability

Because the MEQ was designed to assess individuals' typical everyday emotional experience, we hypothesized that MEQ scores would remain relatively stable over time. Thus, we examined the 3-week test-retest reliability of all MEQ scales.

Methods

Participants were 168 adult undergraduate students recruited through a psychology department participant pool who received course credit for their participation at two time-points approximately 3 weeks apart. Participants were 83% female, 45% East Asian, 27% Caucasian, 6% South Asian, 5% Latin American, 4% Middle Eastern, 1% African-Canadian, and 12%

listed other ethnic backgrounds. Age ranged from 19 to 54 with a mean of 23.7 ($SD = 3.9$). Participants made two visits to our lab a mean of 23.8 days apart (range 18 to 36), and completed the MEQ each time. Ethics approval for data collection was obtained through the University of British Columbia.

Results

We computed test-retest correlations (Pearson) for all MEQ scales. Complete results are presented in Table 6. Regarding the MEQ reactivity scales, test-retest correlations were strong, ranging from .66 (Negative Intensity) to .83 (Positive Frequency), with a median of .76. Test-retest consistency was strong for the MEQ regulation scales as well. Regarding the MEQ discrete emotions scales, test-retest correlations were strong, ranging from .51 (Happy) to .69 (Enthusiastic and Inspired), with a median of .64 (all $ps < .001$).

Discussion

In general, MEQ scales displayed strong test-retest stability over a period of 3 weeks. Stability was robust for all types of scales: reactivity, regulation, and discrete emotions. Results suggest that retrospective reports of emotional experience are stable over time.

General Discussion

This article describes the development, rationale, and psychometric properties of a new self-report measure of emotion, the Multidimensional Emotion Questionnaire (MEQ). The MEQ was designed as an omnibus measure of emotional experience that assesses: overall positive and negative emotional reactivity; 3 components of emotional reactivity (frequency, intensity, and persistence); 10 discrete emotions (5 positive and 5 negative); as well as the ability to regulate these emotions. Findings from the present study support the reliability and validity of the MEQ scales. Specifically, in a large sample of U.S. adults, confirmatory factor

Table 6 3-Week test-retest correlations

| MEQ Reactivity Scale | <i>r</i> | <i>p</i> | MEQ Discrete Emotion Scale | <i>r</i> | <i>p</i> |
|----------------------|----------|----------|----------------------------|----------|----------|
| Overall Positive | .81 | <.001 | Happy | .51 | <.001 |
| Positive Frequency | .83 | <.001 | Excited | .59 | <.001 |
| Positive Intensity | .73 | <.001 | Enthusiastic | .69 | <.001 |
| Positive Persistence | .69 | <.001 | Proud | .57 | <.001 |
| Overall Negative | .80 | <.001 | Inspired | .69 | <.001 |
| Negative Frequency | .81 | <.001 | Sad | .65 | <.001 |
| Negative Intensity | .66 | <.001 | Afraid | .59 | <.001 |
| Negative Persistence | .70 | <.001 | Angry | .62 | <.001 |
| Positive Regulation | .48 | <.001 | Ashamed | .65 | <.001 |
| Negative Regulation | .73 | <.001 | Anxious | .68 | <.001 |

analyses supported the measure's hypothesized structure, internal consistencies for all scales ranged from acceptable to excellent, and scales generally exhibited hypothesized and theoretically consistent associations with each other and with other constructs such as age and negative emotional reactivity. In addition, in a sample of undergraduates, the MEQ demonstrated good test-retest reliability. Thus, the MEQ is likely to be of use to researchers interested in a detailed and valid assessment of emotional experience.

Two weaknesses in the psychometric analyses deserve note. First, the positive regulation scale but not the negative regulation scale demonstrated incremental prediction of a measure of emotion dysregulation beyond the MEQ's overall positive and negative emotional reactivity scales. Consequently, although the negative regulation scale does robustly relate to emotion dysregulation, it is not clear if the scale contains information about emotion dysregulation over and above the MEQ indices of emotional reactivity. Indeed, the negative regulation scale correlated .75 with the negative reactivity scale, suggesting particular difficulty in distinguishing these constructs. This overlap is consistent with previous work documenting difficulties in distinguishing reactivity from regulation (Zelkowitz et al. 2016). At the same time, other research finds less overlap between reactivity and regulation measures, as well as differing relations of these constructs to clinical phenomena (Zelkowitz et al. 2016). Future studies should continue to explore whether, and the circumstances under which, the MEQ negative regulation scale can provide unique information above and beyond emotional reactivity. Interestingly, the positive regulation scale did demonstrate incremental prediction over and above emotional reactivity.

A second weakness is that, while the CFAs assessing structural validity showed strong fit, 6 of the 38 loadings for the negative emotions model and 4 of the 38 loadings for the positive emotions model were not positive as was predicted. It is unclear whether these non-positive loadings warrant a substantive interpretation, or represent expected noise in a complex structure with many degrees of freedom. Five of the non-positive loadings were for the items assigned to the negative intensity scale; however this same scale exhibited strong properties in other psychometric analyses, including strong internal reliability and strong test-retest reliability, suggesting the items comprising this scale provide cohesive and stable information. It is possible that the failure of these negative intensity items to perform as expected in the structural model is due to excessive collinearity with the negative persistence and negative frequency scales (correlations of .71 and .70, respectively). Future research should continue to probe the structural characteristics of the MEQ.

It is important to clarify that while the MEQ can serve an important purpose for emotion research, it is not intended to replace existing measures. For example, if one desires to measure the broad construct of negative emotional reactivity (without indices of individual negative emotions and without coverage of positive

emotional reactivity), the ERS (Nock et al. 2008) would be a more efficient choice since it targets this construct well and would take less time to administer than the MEQ. Similarly, the PANAS (Watson et al. 1988) is the shorter and more efficient choice if one simply requires overall indices of positive and negative emotionality. Also, the PANAS-X (Watson and Clark 1994) contains a wider variety of emotion items and yields some discrete emotion scales not assessed by the MEQ (e.g., Serenity, Shyness, Surprise). However, the PANAS does not provide separate scales for emotional frequency, intensity, and persistence, nor does it include scales to assess the ability to regulate emotions.

There are several important study limitations and future directions. First, there are additional opportunities to obtain construct validity evidence for the discrete emotions scales. For example, self-report measures have been developed to assess the emotions of happiness (Lyubomirsky and Lepper 1999) and anger (Snell et al. 1995). MEQ happiness would be expected to relate to the happiness measure more strongly than would other MEQ discrete emotions scales, and MEQ anger would be expected to relate to the anger measure more strongly than would other MEQ discrete emotions scales.

Second, it is important for future work to probe the utility of the separate reactivity scales. One approach is to verify in additional samples that intercorrelations among these scales are moderate (e.g., .4-.7), rather than large enough to suggest they are redundant (e.g., >.7). A second approach is to examine discriminant validity. For example, research can address how the frequency, intensity, and persistence scales distinguish between patient populations known to have different emotion profiles, such as the frequent anxiety in generalized anxiety disorder vs. the occasional but intense anxiety in phobias, or the persistent sadness in dysthymia vs. the intense sadness in bipolar disorder and the emotional instability in borderline personality disorder.

Third, future research should examine correspondence between MEQ scales and both non-retrospective and non-self-report measures of emotion. For example, examining correspondence between the MEQ and a daily diary assessment of emotion may help determine the extent to which MEQ scores are influenced by retrospective memory bias. In addition, future research could examine correspondence between MEQ scales and psychophysiological measures of emotion. For example, MEQ indices might be expected to correlate with the Late Positive Potential, an event-related potential that appears to index emotional reactivity (Hajcak et al. 2006). In contrast, MEQ overall negative reactivity, and particularly the discrete MEQ emotion "afraid," would be expected to correlate with enhanced startle response during exposure to negative emotional stimuli (Vrana et al. 1988). It is also possible, and perhaps likely, that real-time self-report or physiological measures of emotion in experimental or naturalistic settings may better capture affective chronometry as compared to retrospective self-report.

Finally, as the MEQ was developed to assess emotional experience in diverse populations, it will be important for

future research to examine the psychometric properties of the MEQ in additional populations (e.g., adolescents, older adults, ethnically and culturally diverse populations). In addition, as noted above, future research should examine the MEQ in individuals suffering from psychiatric disorders. Although designed to assess everyday emotional experience in the general population, the MEQ holds promise for capturing and differentiating the experience of emotions in a variety of disorders that have been conceptualized as disorders of emotion, such as depression (Gross and Munoz 1995), anxiety (Mennin et al. 2005), and borderline personality disorder (Glenn and Klonsky 2009).

Conclusions

The MEQ is a new self-report measure of emotional experience that offers several advantages over previous measures. Specifically, the MEQ: assesses both discrete emotions and broad dimensions of emotional reactivity; offers separate emotional reactivity indices for frequency, intensity, and persistence of emotional response; and includes assessment of regulation in addition to reactivity. Initial data from two samples suggests that the MEQ provides a detailed, reliable, and valid measure of emotional experience. Thus, the MEQ is likely to be of use to researchers in diverse fields of psychology interested in emotional experience, including clinical psychology, social psychology, personality psychology, and behavioral neuroscience.

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Compliance with Ethical Standards

Conflict of Interest E. David Klonsky, Sarah E. Victor, Anita S. Hibbert, and Greg Hajcak declare that they have no conflict of interest.

Ethics Approval Ethics approval was obtained from the appropriate university behavioural ethics research board. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Appendix

Multidimensional Emotion Questionnaire

Instructions:

This questionnaire asks about your experience of different emotions such as sad, happy, and afraid. We are interested in assessing four different parts of each emotion. Specifically, for each emotion, you will be asked to rate:

- 1) how *often* you experience the emotion;
- 2) how *intense* the emotion typically is when it occurs
- 3) how *long-lasting* the emotion typically is when it occurs
- 4) how well you can *regulate* the emotion when it occurs (i.e., how well you can reduce or increase the emotion).

Below are two examples to help you better understand how to rate these four parts of emotion.

Example #1

Creative

| | | | | | |
|---------------------------------|------------------------------|---------------------|---------------------|-----------------------|----------------------------|
| 1. <i>How Often?</i> | About once per month or less | About once per week | About once each day | 2 or 3 times each day | More than 3 times each day |
| 2. <i>How Intense?</i> | Very Low | Low | Moderate | High | Very High |
| 3. <i>How Long-Lasting?</i> | Less than 1 minute | 1-10 minutes | 11-60 minutes | 1-4 hours | Longer than 4 hours |
| 4. <i>How Easy to Regulate?</i> | Very Easy | Easy | Moderate | Difficult | Very Difficult |

In the example above, the person chose “About once per week” for “*How Often*” because they do not feel creative very frequently. The person chose “High” for “*How Intense*” because their creativity is strong when it does occur. The person chose “1-4 hours” for “*How Long-Lasting*” because when they feel creative the feeling lasts for a couple hours. Finally, the person chose “Easy” for “*How Easy to Regulate*” because when they feel creative they are able to increase this feeling by choosing appropriate activities.

Example #2

Frustrated

| | | | | | |
|---------------------------------|------------------------------|---------------------|---------------------|-----------------------|----------------------------|
| 1. <i>How Often?</i> | About once per month or less | About once per week | About once each day | 2 or 3 times each day | More than 3 times each day |
| 2. <i>How Intense?</i> | Very Low | Low | Moderate | High | Very High |
| 3. <i>How Long-Lasting?</i> | Less than 1 minute | 1-10 minutes | 11-60 minutes | 1-4 hours | Longer than 4 hours |
| 4. <i>How Easy to Regulate?</i> | Very Easy | Easy | Moderate | Difficult | Very Difficult |

In this second example, the person chose “2 or 3 times” for “*How Often*” because they frequently feel frustrated. The person chose “Moderate” for “*How Intense*” because the strength of their frustration is usually in the medium range. The person chose “Longer than 4 hours” for “*How Long-Lasting*” because when frustrated the feeling lasts for a long time. Finally, the person chose “Very Difficult” for “*How Easy to Regulate*” because when frustrated it is very hard for them to stop feeling that way.

If you understood the examples you are now ready to complete the questionnaire. Below are 10 emotions. Please rate each one based on your typical experience

of that emotion. If you have any questions, please feel free to ask the experimenter. You may begin when ready.

Happy

| | | | | | |
|---------------------------------|------------------------------|---------------------|---------------------|-----------------------|----------------------------|
| 1. <i>How Often?</i> | About once per month or less | About once per week | About once each day | 2 or 3 times each day | More than 3 times each day |
| 2. <i>How Intense?</i> | Very Low | Low | Moderate | High | Very High |
| 3. <i>How Long-Lasting?</i> | Less than 1 min | 1–10 min | 11–60 min | 1–4 h | Longer than 4 h |
| 4. <i>How Easy to Regulate?</i> | Very Easy | Easy | Moderate | Difficult | Very Difficult |

Sad

| | | | | | |
|---------------------------------|------------------------------|---------------------|---------------------|-----------------------|----------------------------|
| 1. <i>How Often?</i> | About once per month or less | About once per week | About once each day | 2 or 3 times each day | More than 3 times each day |
| 2. <i>How Intense?</i> | Very Low | Low | Moderate | High | Very High |
| 3. <i>How Long-Lasting?</i> | Less than 1 min | 1–10 min | 11–60 min | 1–4 h | Longer than 4 h |
| 4. <i>How Easy to Regulate?</i> | Very Easy | Easy | Moderate | Difficult | Very Difficult |

Afraid

| | | | | | |
|---------------------------------|------------------------------|---------------------|---------------------|-----------------------|----------------------------|
| 1. <i>How Often?</i> | About once per month or less | About once per week | About once each day | 2 or 3 times each day | More than 3 times each day |
| 2. <i>How Intense?</i> | Very Low | Low | Moderate | High | Very High |
| 3. <i>How Long-Lasting?</i> | Less than 1 min | 1–10 min | 11–60 min | 1–4 h | Longer than 4 h |
| 4. <i>How Easy to Regulate?</i> | Very Easy | Easy | Moderate | Difficult | Very Difficult |

Excited

| | | | | | |
|---------------------------------|------------------------------|---------------------|---------------------|-----------------------|----------------------------|
| 1. <i>How Often?</i> | About once per month or less | About once per week | About once each day | 2 or 3 times each day | More than 3 times each day |
| 2. <i>How Intense?</i> | Very Low | Low | Moderate | High | Very High |
| 3. <i>How Long-Lasting?</i> | Less than 1 min | 1–10 min | 11–60 min | 1–4 h | Longer than 4 h |
| 4. <i>How Easy to Regulate?</i> | Very Easy | Easy | Moderate | Difficult | Very Difficult |

Angry

| | | | | | |
|---------------------------------|------------------------------|---------------------|---------------------|-----------------------|----------------------------|
| 1. <i>How Often?</i> | About once per month or less | About once per week | About once each day | 2 or 3 times each day | More than 3 times each day |
| 2. <i>How Intense?</i> | Very Low | Low | Moderate | High | Very High |
| 3. <i>How Long-Lasting?</i> | Less than 1 min | 1–10 min | 11–60 min | 1–4 h | Longer than 4 h |
| 4. <i>How Easy to Regulate?</i> | Very Easy | Easy | Moderate | Difficult | Very Difficult |

Ashamed

| | | | | | |
|---------------------------------|------------------------------|---------------------|---------------------|-----------------------|----------------------------|
| 1. <i>How Often?</i> | About once per month or less | About once per week | About once each day | 2 or 3 times each day | More than 3 times each day |
| 2. <i>How Intense?</i> | Very Low | Low | Moderate | High | Very High |
| 3. <i>How Long-Lasting?</i> | Less than 1 min | 1–10 min | 11–60 min | 1–4 h | Longer than 4 h |
| 4. <i>How Easy to Regulate?</i> | Very Easy | Easy | Moderate | Difficult | Very Difficult |

Enthusiastic

| | | | | | |
|-----------------------------|------------------------------|---------------------|---------------------|-----------------------|----------------------------|
| 1. <i>How Often?</i> | About once per month or less | About once per week | About once each day | 2 or 3 times each day | More than 3 times each day |
| 2. <i>How Intense?</i> | Very Low | Low | Moderate | High | Very High |
| 3. <i>How Long-Lasting?</i> | Less than 1 min | 1–10 min | 11–60 min | 1–4 h | Longer than 4 h |

| | | | | | |
|---------------------------------|------------------------------|---------------------|---------------------|-----------------------|----------------------------|
| 4. <i>How Easy to Regulate?</i> | Very Easy | Easy | Moderate | Difficult | Very Difficult |
| Proud | | | | | |
| 1. <i>How Often?</i> | About once per month or less | About once per week | About once each day | 2 or 3 times each day | More than 3 times each day |
| 2. <i>How Intense?</i> | Very Low | Low | Moderate | High | Very High |
| 3. <i>How Long-Lasting?</i> | Less than 1 min | 1–10 min | 11–60 min | 1–4 h | Longer than 4 h |
| 4. <i>How Easy to Regulate?</i> | Very Easy | Easy | Moderate | Difficult | Very Difficult |
| Anxious | | | | | |
| 1. <i>How Often?</i> | About once per month or less | About once per week | About once each day | 2 or 3 times each day | More than 3 times each day |
| 2. <i>How Intense?</i> | Very Low | Low | Moderate | High | Very High |
| 3. <i>How Long-Lasting?</i> | Less than 1 min | 1–10 min | 11–60 min | 1–4 h | Longer than 4 h |
| 4. <i>How Easy to Regulate?</i> | Very Easy | Easy | Moderate | Difficult | Very Difficult |
| Inspired | | | | | |
| 1. <i>How Often?</i> | About once per month or less | About once per week | About once each day | 2 or 3 times each day | More than 3 times each day |
| 2. <i>How Intense?</i> | Very Low | Low | Moderate | High | Very High |
| 3. <i>How Long-Lasting?</i> | Less than 1 min | 1–10 min | 11–60 min | 1–4 h | Longer than 4 h |
| 4. <i>How Easy to Regulate?</i> | Very Easy | Easy | Moderate | Difficult | Very Difficult |

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