

Differential assessment of emotions and moods: Development  
and validation of the Emotion and Mood Components of  
Anxiety Questionnaire

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## Abstract

Our research assessed whether mood and emotion can be measured as distinct constructs. Development and validation of the Emotion and Mood Components of Anxiety Questionnaire (EMCA-Q) is reported. We based the questionnaire on a subjective-contextual model of emotion-mood distinctions, which specifies that differentiation of the emotion of anxiety from an anxious mood should reflect an individual's awareness of the context in which the respective feeling states occur. In study 1, we describe the development of the 10-item, two factor EMCA-Q. In study 2, we use confirmatory factor analysis to provide support for the factorial validity of the scale. In study 3, we provide preliminary evidence of construct validity by demonstrating that students preparing to submit their thesis reported significantly higher scores of anxious emotion about their thesis than anxious mood. Findings suggested that emotion and mood might be distinguished empirically in line with theoretical predictions when subjective-contextual information used to distinguish between the two states was assessed.

Key words: confirmatory factor analysis; measurement; psychometric; validity; affect; stress; emotion; mood.

## 1. Introduction

The conceptualisation of emotion and mood as distinct phenomena has received much attention in the psychology and philosophy literatures. Historically, differentiation of emotion from mood has been problematic both conceptually and, in particular, in terms of measurement. In everyday speech, feeling states such as anxiety can be described as either an emotion or a mood; we can experience the emotion of anxiety or be in an anxious mood. This semantic problem reflects the close similarity of the two constructs given that, from the perspective of the person experiencing them, the emotion of anxiety and an anxious mood may feel identical (Watson, 2000).

Previous approaches to distinguishing emotion from mood in the academic literature have focused on structural distinctions, such as contrasting the brief intensity of an emotion with the more enduring and diffuse nature of a mood (Watson & Clark, 1997). Despite their intuitive appeal, none of the proposed emotion-mood distinctions are supported by published data, nor is there an accepted methodology for use in investigating the issue. Several measures of either emotion *or* mood have been published (see Matthews, Jones, & Chamberlain, 1990; Power, 2006; Watson, Clark, & Tellegen, 1988), although none of them distinguish between the two constructs. This is perhaps because the development of a differential scale requires a theoretical framework that clearly operationalizes emotion-mood distinctions beyond simple structural criteria.

The complexity of distinguishing emotion from mood should not be underestimated, especially given the volume of research interest in the topic. Beedie, Terry, and Lane (2005) addressed this issue by firstly conducting a content analysis of 65 published works that offered distinctions between emotion and mood. They also used qualitative methods to investigate emotion-mood distinctions among a sample of 106 non-academic participants, arguing for the utility of folk theory (see Colman, 2001) in conceptual development. The authors reported a high level of agreement between academic and non-academic opinions in both the nature and direction of potential distinguishing criteria. They identified eight distinguishing themes, with duration, intentionality, cause, consequences, and function cited most frequently, and intensity, physiology, and awareness of cause cited less frequently. In summarising, the authors proposed that emotion and mood can be distinguished empirically if the subjective context of the affective responses (i.e., the individual's awareness of the antecedents, focus, and likely consequences) is also assessed in line with theoretical distinctions.

Subsequently, Beedie (2007) proposed that the subjective context in which an individual experiences feelings such as anxiety or anger determines whether they should be interpreted as emotions or moods. This proposal extended the work of Clore (1994) who explained how emotion and mood could feel similar but be perceived as different constructs. Subjective context also influence the availability of strategies to regulate such feelings. For example, if a person feels angry following an argument with a partner, there is an opportunity to re-appraise the context surrounding the argument and potentially attenuate the anger. By contrast, if a person feels angry

but cannot identify a cause of those feelings, its focus will be unconstrained. If the person can identify the cause of feelings, then he or she could attempt to re-appraise its meaning, whereas if the perceived cause is not known, suppression of feelings is the likely regulation strategy (Gross & John, 2003).

When the criteria identified by Beedie et al. (2005) are applied to existing measures, it is apparent why no published data are available to demonstrate emotion and mood distinctions. Most scales use single adjective items that assess affective responses without providing contextual information (Power, 2006). Although it is tempting to infer emotion-mood distinctions from structural information relating to duration or intensity of feelings, which is included in some scales, this is not reliable. Using anxiety as an example, irrespective of whether the response timeframe suggests short duration (how do you feel *right now*) or enduring feelings (how have you felt *this week*), no information as to whether the anxiety is an emotion or a mood is available. A *right now* format does not distinguish between a current mood and a current emotion, and a *this week* format does not clarify whether the respondent has been in the same anxious mood or emotionally anxious about the same thing during that period. Likewise the intensity of responses is unhelpful. Although it is tempting to assume that low intensity anxiety is a mood and high intensity anxiety an emotion, the respondent could be mildly emotionally anxious or in an intensely anxious mood.

Figure 1 graphically represents the criteria identified by Beedie et al. (2005) for distinguishing emotion from mood. A proposed 5-stage process commences with recognition of an affective response that may or may not register in consciousness. In stage 3, the appraisal stage, the person seeks to determine the cause of feelings and in stage 4 decides whether action is to be taken. Stage 5 is a behavioral response, which also serves as a feedback loop to the initial affective response. The present study applied the model to the development of a questionnaire to distinguish an anxious mood from the emotion of anxiety. To validate our measure, we report the findings of three studies. In study 1, we report the development of the content validity of items. In study 2, we test the hypothesized factor structure using confirmatory factor analysis in academic and competitive settings. In stage 3, we test changes in mood and emotions over time in relation to a personally meaningful stressor.

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Figure 1 here

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Although any one of several discrete feeling states could have been chosen as the ‘vehicle’ state for distinguishing emotion from mood, anxiety was selected because it is a common affective response among several populations of interest. Anxiety also has theoretical emotion and mood components. For example, performance anxiety is an emotion as generally conceived (i.e., both caused by, and about, something), whereas ‘free-floating’ anxiety is a prototypical mood (i.e., diffuse and not about any particular thing) (Zajonc, 1984; Watson, 2000).

## 2. Study 1: Development of the EMCA-Q

Using the model in Figure 1, an emotion is defined as a feeling caused by a specific object and focused on that object (i.e., it is *about* the object). Emotions have behavioral consequences. Mood is defined as a set of feelings that are neither caused by nor focused on a specific object. Moods have cognitive consequences. The definitions are independent of structural criteria such as intensity and duration.

### 2.1 Item development

To facilitate the development of anxiety-related items appropriate to the target population we recruited 20 student-athletes (Age:  $M = 21.4$ ,  $SD = 4.5$  yr., Male  $n = 11$ , Female,  $n = 9$ ), all of whom had competed in sport to regional level and passed academic qualifications to enable entry onto a degree program. Participants were asked to suggest adjectives that best describe feelings they experience in stressful situations, such as sports competitions, academic examinations or before important deadlines. The most frequently cited feelings included “anxious”, “unconfident”, “edgy”, and “tense”.

We extended this adjective list by incorporating words from several lexical taxonomies found in the general psychology literature (e.g., Ortony, Clore, & Foss, 1987; Power, 2006; Russell, 1989) and sport psychology literature (Jones, Lane, Bray, Uphill, & Catlin, 2005; Terry, Lane, & Fogarty, 2003). Ambiguous items, including descriptors of physical states (e.g., “tense”), cognitive states (e.g., “concerned”) and descriptive states (e.g., “vulnerable”) were removed, as recommended by Ortony et al. (1987). “Concerned”, for example, might relate to feeling anxious but it could also be interpreted as meaning “interested”.

The resultant stimulus list included 37 anxiety-related adjectives. Subsequently, we asked 96 student-athletes ( $M = 19.78$  yr.,  $SD = 1.37$  yr., Male  $n = 56$ ; Female  $n = 40$ ) to identify those items they most associated with emotional responses in sport and academic situations. The five most frequently experienced feelings were “anxious”, “nervous”, “apprehensive”, “worried”, and “self-doubting”.

These descriptors were incorporated into two 5-item scales of statements describing emotion and mood, in line with the model shown in Table 1. Emotional-anxiety items reflected a focus on particular events and goals, whereas anxious-mood items were phrased to reflect feelings that were neither caused by nor focused on a particular event. Participants were asked to rate how they were feeling *right now*. Items were scored on a 4-point likert scale ranging from 0 = “not at all” to 4 “very much so”.

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Table 1 here

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The 10 items, along with their respective context (see Tables 2 and 3), were subsequently tested for factorial validity using confirmatory factor analysis (CFA).

Consistent with theoretical predictions, we hypothesized that the emotion and mood items would form independent factors across two different samples.

## **Study 2: Test of factorial validity**

### *2.1 Method*

We tested the factorial validity of the EMCA-Q by administering the measure to two independent samples. The scale was worded to be specific for sports performance (sample 1) and academic assessment (sample 2) situations.

Participants in sample 1 were 190 student athletes ( $M = 21.9$  yr.,  $SD = 3.8$  yr., (Male  $n = 109$ , Female,  $n = 89$ ),) studying for undergraduate degrees in sport and exercise science at a university in London. Participants were instructed to recall an event in which they had competed in the past three months. To facilitate an accurate recollection of pre-competition anxiety, participants were encouraged to recount the precise details of the period of time leading up to the event in question. Ekman and Davidson (1994) suggested that people tend to remember emotionally-charged events well, and retrospective measures of anxiety have been shown to be reliable up to three months after competition (Hanin & Syrja, 1996). Participants completed the EMCA-Q after recalling how they felt immediately prior to the competition.

Participants in sample 2 were 300 undergraduate and graduate students at a London university ( $M = 24.7$  yr.,  $SD = 2.4$ , Male  $n = 141$ , Female  $n = 159$ ). Students completed an exam-specific version of the EMCA-Q approximately 20 minutes before commencing the final examinations of their degree. After gaining ethical clearance from the institute of the first author, written informed consent was obtained from all participants.

We assessed model fit with the comparative fit index (CFI) and the standardized root mean-squared residual (SRMR) using fit benchmarks suggested by Hu and Bentler (1999). Three theoretically-driven models were tested; a correlated two-factor model of five items each, an uncorrelated two-factor model of five items each, and a single-factor model of anxiety that included all 10 items which, if supported, would suggest that the measure could not distinguish between the two constructs. We hypothesized that the two-factor correlated model would show the best fit as it specified a degree of conceptual independence, whilst recognizing that mood and emotion are often experienced simultaneously (Parkinson, Totterdell, Briner, & Reynolds, 1996). It is acknowledged that we could have tested alternative models such as those that could be generated from exploratory factor analysis, we restricted our analysis to the primary theoretical issues.

### *3.2 Results and discussion*

Preliminary analyses indicated that data were not normally distributed in either sample (Sample 1, Mardia = 5.08; Sample 2, Mardia = 16.10), hence the robust estimation method (RCFI) was used. As shown in Table 3, CFA results provided support for the correlated model in both samples, although fit indices were marginal.

Support for the correlated model indicated that emotion and mood states tend to co-occur (emotion-mood:  $r = .72$ ,  $P < .01$ ) as suggested by Beedie et al. (2005). Both alpha coefficients were acceptable (emotion = .82, mood = .71), suggesting two internally reliable factors. Given the transient nature of mood and emotion, alpha coefficients are preferred to test-retest design. Results were consistent with the notion that an individual in an anxious mood is more likely to experience the emotion of anxiety in specific situations, while the factors that elicited that emotion, or the emotion itself, may simultaneously contribute to the development of an anxious mood. It has been argued that the affective residue from one situation influences the appraisal process of a subsequent one, in which case the individual cannot attribute the cause of feelings to one event or object (Lane & Terry, 2000; Parkinson et al., 1996). It should be noted that the uncorrelated model showed poor fit indices. This suggests that anxious feelings have a common core regardless of whether they are perceived to be linked to a specific context (emotion) or not (mood). From a folk psychology perspective, this supports the premise that despite the acknowledged distinction between an emotion and a mood in the English language, there is sufficient commonality between these two constructs for them both to be labelled anxiety in some instances.

Collectively, model testing provided provisional evidence of factorial validity and internal reliability. Given the marginal difference in fit indices between the single-factor and correlated models, however, the relative independence of emotion and mood factors remained uncertain. We therefore examined how the mood and emotion scales would be influenced by a meaningful stressor. If mood and emotion represent different constructs, then they should behave differently.

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Table 2 about here

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### **3. Study 3: Test of differences in emotion and mood responses over time**

#### *3.1 Method*

Theoretical predictions suggest that emotional responses are triggered by exposure to a specific event. This study focused on changes in emotion and mood responses among students preparing for the submission of a final year thesis. Previous research has identified that students perceive such a situation as stressful (Collins & Onwuegbuzie, 2003; Devonport & Lane, 2006). We hypothesized that the intensity of emotion would increase significantly over time (as the submission date loomed) whereas the intensity of mood would not.

Fifty-one undergraduate students who were completing their final year thesis (male = 29; female = 31; age range: 20-32 yr.) completed the EMCA-Q at 6 weeks, 4 weeks, and 2 weeks before thesis submission. The EMCA-Q was reworded for thesis completion.

#### 4.2 Results and discussion

Mean emotion and mood responses at three time points leading up to thesis submission are shown in Figure 2. A repeated-measures MANOVA identified a significant main effect for changes in emotion and mood responses over time (Wilks lambda  $_{4,47} = .12$ ,  $p < .001$ , partial  $\eta^2 = .88$ ). Univariate analyses showed, as hypothesized, that the intensity of emotion increased over time ( $F_{2,100} = 95.12$ ,  $p < .001$ , partial  $\eta^2 = .66$ ) whereas no significant changes in mood responses occurred ( $F_{2,100} = 1.92$ ,  $p = .15$ , partial  $\eta^2 = .04$ ). Consistent with theoretical predictions, emotion scores increased at each time point. Paired t-tests identified significant differences between emotion and mood scores at each time point (6 weeks,  $t = 4.29$ ,  $p < .001$ ; 4 weeks,  $t = 6.96$ ,  $p < .001$ ; and 2 weeks,  $t = 11.67$ ,  $p < .001$ ).

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Figure 2 here

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Findings demonstrated that emotions and mood responses, as assessed by the EMCA-Q, varied as hypothesized. Emotional states increased in relation to the impending thesis hand-in date whereas mood states did not. Emotion scores were significantly higher than mood scores at each time point. We suggest that the predominance of emotions indicates that students were cognisant of the perceived causes of these feelings, which is unsurprising given the explicit demands of thesis completion.

In summary, responses to the EMCA-Q demonstrated meaningful differences in emotion and mood responses in the weeks leading up to thesis hand-in. Given that participants' responses were consistent with the underlying theory, these findings provide initial evidence of construct validity and demonstrate the potential utility of the EMCA-Q for applied practitioners. Where intense emotions are evidenced, the cause of feelings is known. In such circumstances, practitioners could counsel individuals to direct their coping efforts towards managing the situation in addition to self-regulation. Where the cause of feelings remains unknown, mood enhancement strategies centered on self-regulation can be advocated and supported (Gross & John, 2003).

#### 4. General discussion

It is evident from even a cursory review of the scientific literature that most psychologists believe there is a difference between an emotion and a mood (e.g., Baumeister, Vohs, DeWall, & Zhang, 2007; Ruys & Stapel, 2008). Empirical evidence that laypeople similarly differentiate emotions from moods is also available in the literature (Beedie et al., 2005). However, such differences are problematic to implement in practice due to the substantial phenomenological and linguistic overlap between the two constructs. Thus, the issue of establishing whether an episode of anxiety, anger or depression is an emotion or a mood is rarely addressed explicitly in psychological research.

Researchers often define a feeling state as an “emotion” or a “mood” but rarely describe their rationale for doing so. The present results showed that the

constructs of emotion and mood can be distinguished empirically via self-report. This distinction was achieved by first conceptualizing emotion and mood as subjective context-dependent states. Given the varying conceptualizations of emotion and mood in the literature, however, we acknowledge that our distinction will not be universally accepted.

Our test construction process began with an empirical investigation of the factors that might distinguish emotion from mood (Beedie et al., 2005), followed by a philosophical enquiry into the nature of these factors (Beedie, 2007). Next, we utilized rigorous test development procedures to ensure content validity of the EMCA-Q, after which we used confirmatory factor analysis to demonstrate factorial validity in two independent samples. Finally, we demonstrated that EMCA-Q show adequate test-retest reliability in situations when emotion and mood factors behave differently in relation to a stressor. Taken collectively, we have provided initial evidence of construct validity, whilst acknowledging that scale validation is an ongoing process (Murphy & Davidshofer, 1998) and tests of criterion validity have yet to be conducted.

We propose two significant implications of our findings. First, we have demonstrated that when assessing anxiety, it is important to be aware that it can be intentional (i.e., one can be anxious *about* something), or non-intentional (i.e., one can be anxious about nothing in particular and seemingly for no particular reason). Logically, the fact that intentional and non-intentional anxiety can be distinguished by the person experiencing them suggests that intentional and non-intentional anxiety are indeed two different constructs; what are commonly termed emotion and mood. Hence, questionnaires with single-word descriptors cannot reliably distinguish emotion from mood. Although emotion-mood distinctions may not be important in some settings, a self-report measure that fails to indicate the degree to which anxiety is intentional or non-intentional may not allow a researcher to make a valid measurement nor a practitioner to make a practically useful diagnosis.

The second, and perhaps more significant, implication of our findings is that our empirical differentiation of emotion from mood should encourage researchers and practitioners working within the affective domain to use the terms with greater precision, in keeping with the scientific ethos that underlies the study of human behavior. For example, when a technique is described as a mood induction, it should describe the induction of a non-intentional and diffuse state. If the subject is both aware of the cause and the object of the induced state, it is almost certainly an emotion induction rather than a mood induction and should be referred to accordingly. Similarly, when discussing pre-competition emotions, authors should ensure they are describing intentional states related to the upcoming competition, not feelings that may relate to ongoing existential issues unrelated to the competition. Only by using terms with precision will many of the inconsistencies in emotion and mood research be clarified. In fact, it is hoped that the findings of the present study will encourage the re-appraisal of several consistently contradictory areas of research, such as mood

and memory and mood and sports performance, where the moods in question may be contaminated by, or in fact be, emotions.

It is important to balance the contribution of our findings by acknowledging some limitations of the three studies presented. Firstly, self-reports of anxiety assume that people have the capability and desire to describe accurately how they are feeling. Although this assumption may not always hold true, with current technologies, self-report provides the only access to the subjective processes under investigation. We acknowledge, however, that greater efforts could have been made to control for response bias, particularly in study 3. Secondly, sample sizes for the confirmatory factor analysis studies were relatively small, limiting the generalizability of the findings back to the population from which they were drawn. Thirdly, we focused exclusively on anxiety and, although this is a useful starting point, it is too early to suggest that emotion and mood distinctions could be identified for other constructs. Fourthly, the validation process would have benefitted from a test-retest design in which no changes in anxiety were expected. Fifthly, a concurrent validity study would elucidate how anxious mood and emotion relate to constructs whose validity has been already established. We suggest that attempting to address the limitations should be a priority for future investigations.

In conclusion, one particular distinguishing criterion, subjective context, was chosen by which to differentiate emotion from mood. Although results provide provisional support for the validity of the EMCA-Q, we acknowledge that future research is needed. Such research might continue to validate the EMCA-Q or approach the question of how to distinguish mood from emotion from a different starting point. The choice of the subjective context was the result of a logical reasoning process (see Beedie, 2007) but other equally valid approaches may be possible. We hope that future research addressing emotion-mood distinctions may open the door to alternative models. In such cases, the EMCA-Q or a similar questionnaire might serve in the role of a manipulation check or a means of cross-validation for researchers seeking to distinguish emotion from mood via, for example, neurological or biochemical indices.

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