



# Emotional reactivity, intensity, and perseveration: Independent dimensions of trait affect and associations with depression, anxiety, and stress symptoms



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## ABSTRACT

**Background:** Individual differences in emotional reactivity and perseveration have recently been demonstrated to account for independent variance in trait positive and negative affect. We extend this research and investigate: 1) if individual differences in the tendency to experience intense emotions (emotional intensity) represent an additional dimension of trait positive and negative affect, and 2) if emotional reactivity, intensity, and perseveration are differentially associated with psychological distress and symptoms of depression, anxiety, and stress.

**Method:** Undergraduate students ( $n = 472$ ) completed the Positive and Negative Affect Schedule (PANAS), the Emotional Reactivity Intensity and Perseveration Scale (ERIPS, adapted from the PANAS), the Kessler Psychological Distress Scale (K10), and the Depression Anxiety and Stress scales (DASS).

**Results:** Psychometric analyses confirmed the hypothesised structure of the ERIPS, with all subscales demonstrating excellent internal consistency. Correlations with the K10 established criterion validity. Emotional reactivity, intensity and perseveration accounted for unique variance in trait positive and negative affect scores and were differentially associated with psychological distress, depression, anxiety and stress scores.

**Conclusion:** Findings provide a preliminary validation of the ERIPS and suggest emotional reactivity, intensity, and perseveration represent independent dimensions of trait affect. Future research investigating these dimensions could enhance understanding of normal emotional responding and emotional vulnerability.

## 1. Introduction

Watson and Tellegen (1985) organised affective experiences around the dimensions of positive and negative affect. Positive affect (PA) is characterised as pleasurable engagement with one's environment, and feelings such as enthusiasm, whereas negative affect (NA) refers to unpleasant engagement, subjective distress, withdrawal, and adverse feelings, such as irritability (Watson & Clark, 1984). Individual differences in trait positive and negative affect (the stable predisposition to experience positive and negative emotions; Watson & Clark, 1984; Watson & Tellegen, 1985) have received considerable empirical and theoretical attention due to their links with mood and anxiety disorders (Watson, Gamez, & Simms, 2005). Trait PA is positively associated with physical and subjective wellbeing, and inversely related to mental illness (Beck et al., 2003; Cohen & Pressman, 2006). In contrast, trait NA is predictive of stress, depression, anxiety, and inversely related to mental health and wellness (Beck et al., 2003; Crawford & Henry, 2004; Lonigan, Phillips, & Hooe, 2003; Watson, Clark, & Carey, 1988).

Trait affect is typically assessed using self-report instruments. Of these, the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) is the gold standard and most frequently used. The PANAS measures the extent to which individuals *generally* feel positive and negative emotions. Theoretically, individual differences in a number of different types of dispositional emotional responding could underlie variation in trait affect scores. Recent research has supported two types of emotional responding as underlying individual differences in trait PA and NA: Emotional reactivity (a disposition that reflects increased probability of experiencing positive or negative affect in response to situations or stimuli) and emotional perseveration (a disposition to experience prolonged emotional reactions once elicited; Boyes, Carmody, Clarke, & Hasking, 2017).

Reactivity and perseveration have also been dissociated in trait anxiety, a construct closely related to NA (Bados, Gómez-Benito, & Balaguer, 2010). Specifically, anxiety reactivity and anxiety perseveration independently account for variance in trait anxiety scores (Rudaizky & MacLeod, 2013; Rudaizky, Page, & MacLeod, 2012) and

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predict state anxiety in the context of a stressor (Rudaizky & MacLeod, 2014). More recently, Boyes et al. (2017) developed the Emotional Reactivity and Perseveration Scale (ERPS, adapted from the PANAS) to measure individual differences in emotional reactivity and perseveration. Reactivity and perseveration accounted for unique variance in trait affect scores and were differentially associated with symptoms of depression, anxiety, and stress. Perseveration of negative affect was associated with symptoms of depression, but not anxiety. In contrast, negative emotional reactivity predicted symptoms of anxiety, but not depression. Additionally, positive reactivity was associated with lower depression, anxiety, and stress scores, whereas, perseveration of positive affect had no association with any mental health variables.

Relatedly, Larsen and colleagues (Diener, Larsen, Levine, & Emmons, 1985; Larsen, 1984; Larsen & Diener, 1987) also established that the intensity or magnitude of an emotional experience is a salient characteristic of emotional responding, that there are stable individual differences in affect intensity, and that higher levels of affect intensity are associated with psychological distress. Specifically, individuals who experience more intense negative emotions tend to experience greater psychological distress (Bornovalova, Matusiewicz, & Rojas, 2011) and anxiety (Brumariu & Kerns, 2013). Although affect intensity has received significant attention, problems with its measurement remain. For example, the Affect Intensity Measure (AIM; Larsen, 1984) asks respondents how frequently they experience differing levels of emotional intensity, thereby conflating the frequency (i.e. emotional reactivity) and intensity of emotional responses (Bachorowski & Braaten, 1994). Similarly, items on the Emotional Reactivity Scale (ERS; Nock, Wedig, Holmberg, & Hooley, 2008) conflate the frequency, perseveration, and intensity of emotional responses. Finally, existing measures of affect intensity do not always distinguish between positive and negative emotional responses (e.g. “I experience emotions very strongly”).

This study extended the ERPS to additionally measure individual differences in emotional intensity, thereby providing a single measure of three types of emotional responding (reactivity, intensity, and perseveration), which map directly onto trait PA and NA as measured by the PANAS. We aimed to establish the basic psychometric properties (structure, internal consistency, and criterion validity) of the Emotional Reactivity Intensity and Perseveration Scale (ERIPS) and determine whether the proposed reactivity, intensity, and perseveration dimensions are independently associated with trait PA and NA. Finally, we explored whether the ERIPS subscales were differentially associated with psychological distress and symptoms of depression, anxiety, and stress.

## 2. Method

### 2.1. Participants

Undergraduate psychology students ( $n = 472$ ) ranging from 17 to 64 years old ( $M = 22.27$ ,  $SD = 6.44$ , 74% Female) participated in the study. Of the sample, 115 (24.4%) reported a prior diagnosis of mental illness, most commonly a depressive ( $n = 29$ ) or anxiety ( $n = 16$ ) disorder, or a combination of depression and anxiety ( $n = 38$ ). This is comparable to the prevalence of mental disorders among Australians aged 16 to 24 (Australian Institute of Health and Welfare, 2011).

### 2.2. Materials

#### 2.2.1. Positive and negative affect

Trait affect was measured using the dispositional version of the PANAS. The PANAS contains two 10-item subscales, assessing PA (e.g. proud, excited) and NA (e.g. upset, nervous). Using a 5-point Likert scale (1: *very slightly or not at all*; 5: *extremely*), respondents rate the extent to which they ‘generally’ feel each emotion. The PANAS has demonstrated excellent psychometric properties (Crawford & Henry,

2004), including high internal consistency (PA = 0.88; NA = 0.87; Watson, Clark, & Tellegen, 1988). Cronbach’s alphas in the current sample were  $\alpha = 0.88$  for PA and  $\alpha = 0.89$  for NA.

#### 2.2.2. Emotional reactivity, intensity, and perseveration

The proposed reactivity, intensity, and perseveration dimensions of emotion were measured using the ERIPS (totalling 60 items, Appendix A). The ERIPS uses the original 20 adjectives of the PANAS; however, the instructions and response options have been adapted to reflect reactivity, intensity, and perseveration. To assess reactivity, participants were asked, “When exposed to a situation that would make the ‘average’ person experience this feeling, how likely is it that you will experience this particular feeling?” (1: *not at all likely*; 5: *extremely likely*). To assess intensity, participants were asked, “When you are experiencing a situation that does make you feel this way, how intense is the feeling compared to how other people feel?” (1: *not at all intense*; 5: *extremely intense*). To assess perseveration, participants were asked, “When you are experiencing a situation that does make you feel this way, how long is this feeling likely to persist?” (1: *not at all persistent*; 5: *extremely persistent*). Relevant items were summated to generate separate indices of positive reactivity, intensity, and perseveration, and negative reactivity, intensity, and perseveration.

#### 2.2.3. Psychological distress

General psychological distress was measured using the 10-item Kessler Psychological Distress Scale (K10; Kessler et al., 2002). Using a 5-point scale (1: *none of the time*; 5: *all of the time*), participants indicated how frequently they experienced symptoms of psychological distress over the past four weeks. The K10 has evidenced high internal consistency ( $\alpha = 0.92$ ; Kessler et al., 2002) and good construct reliability and validity as a screening tool for mental illnesses (Kessler et al., 2003). Internal consistency was excellent in the current sample ( $\alpha = 0.91$ ). Symptoms of depression, anxiety, and stress were assessed using the 21-item Depression Anxiety and Stress Scales (DASS; Lovibond & Lovibond, 1995). Using a 4-point scale (0: *never*; 3: *almost always*) participants rated the presence of symptoms over the past week. The DASS subscales have shown good internal consistency and construct validity (Henry & Crawford, 2005). Cronbach’s alphas in the current study were 0.90, 0.84, and 0.86 for depression, anxiety, and stress respectively.

### 2.3. Procedure

Following ethical approval, the study was advertised on an online booking system for undergraduate psychology students wanting to participate in research for course credit. After providing informed consent, participants were invited to complete the online survey in their own time. Participants first completed the PANAS, followed by the ERIPS, K10 and DASS. Details of relevant counselling resources were provided at the beginning and end of the survey.

### 2.4. Statistical analysis

Statistical assumptions for each analysis were considered prior to analyses; all assumptions were met. Data were analysed in five stages. First, correlations between possible confounders (age, gender, and a history of mental illness) and the variables of interest were tested. Second, we assessed the factor structure and internal consistencies of the ERIPS subscales. Confirmatory factor analyses were conducted to test the hypothesised six-factor structure of the ERIPS, as well as an alternative higher order model in which the positive/negative reactivity, intensity, and perseveration factors loaded onto general PA and NA factors. Internal consistencies were assessed with Cronbach’s alpha. Third, the criterion validity of the ERIPS was assessed by examining correlations between ERIPS subscales and general psychological distress. Fourth, two multiple linear regressions were conducted to

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