



Emotional reactivity and perseveration: Independent dimensions of trait positive and negative affectivity and differential associations with psychological distress



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ABSTRACT

Background: Theoretically, two types of emotional responding could underlie individual differences in trait affect: 1) a disposition reflecting increased probability of experiencing positive or negative emotions (emotional reactivity), and 2) a disposition to experience prolonged emotional reactions once elicited (emotional perseveration). We developed a measure of these dimensions and investigated whether emotional reactivity and perseveration 1) account for unique variance in trait affect, and 2) are differentially associated with symptoms of psychological distress.

Method: In Study 1, participants (T1: $n = 90$; T2: $n = 51$) completed the Positive and Negative Affect Schedule (PANAS) and the Emotional Reactivity and Perseveration Scale (ERPS, adapted from the PANAS). In study 2, participants ($n = 228$) completed the PANAS, ERPS, and Depression Anxiety Stress Scales.

Results: Study 1 established the basic psychometric properties of the ERPS and demonstrated that emotional reactivity and perseveration accounted for unique variance in trait positive and negative affect. Study 2 confirmed these findings and established that emotional reactivity and perseveration are differentially associated with depression, anxiety, and stress scores.

Conclusion: Emotional reactivity and perseveration represent independent dimensions of trait affect. Considering these dimension in future research could further the understanding of both normal emotional responding and emotional vulnerability.

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1. Introduction

The seminal work of Watson and colleagues proposed that individual differences in emotional experience can be organised around two affective dimensions (Watson & Clark, 1984; Watson, Clark, & Tellegen, 1988; Watson & Tellegen, 1985). Positive affect (PA) is conceptualised as a pleasurable engagement with one's environment, and includes feelings such as joy and contentment. In contrast, negative affect (NA) is a dimension of subjective distress comprising a range of aversive mood states (e.g. irritability, anger, distress; Watson & Clark, 1984; Watson & Tellegen, 1985). From this perspective trait PA refers to the stable predisposition towards the experience of positive emotion, whereas trait NA is a stable predisposition towards negative emotion. Individual differences in trait affect are predictive of both psychological distress and wellbeing. Specifically, PA is positively associated with subjective

wellbeing and negatively associated with psychopathology, while NA is associated with affective disorders, including depression and anxiety, and negatively associated with wellbeing (Crawford & Henry, 2004; Hu & Gruber, 2008; Lonigan, Phillips, & Hooe, 2003; Watson, Clark, & Carey, 1988). Additionally, NA prospectively predicts symptoms of anxiety and depression, offering further evidence for the role of trait NA as a risk factor for the development of internalising disorders (Lonigan et al., 2003).

Trait PA and NA are typically assessed using the dispositional version of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), which measures the extent to which individuals experience negative and positive emotions "in general". Theoretically, at least two different types of dispositional emotional responding could underlie variation in such trait negative and positive affect scores: 1) a disposition that reflects increased probability of experiencing positive or negative affect in response to situations or stimuli (*emotional reactivity*), and 2) a disposition to experience prolonged emotional reactions once elicited (*emotional perseveration*). Either of these dispositions would increase the amount of time spent experiencing a given emotion, and should therefore be associated with higher trait negative and positive affectivity scores.

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Recently, Rudaizky and colleagues demonstrated that reactivity and perseverance are dissociable dimensions of a construct closely related to NA, trait anxiety (Rudaizky & MacLeod, 2013, 2014; Rudaizky, Page, & MacLeod, 2012). Trait anxiety has traditionally been viewed as a unitary construct and is typically assessed using self-report questionnaires requiring respondents to rate how often they experience specific symptoms (e.g. worry). Rudaizky and colleagues posited that anxiety reactivity and anxiety perseverance could both underlie variation in trait anxiety scores (Rudaizky et al., 2012). They created the Anxiety Reactivity Perseveration Scale (ARPS), adapted from the trait version of the State-Trait Anxiety Inventory, STAI-T (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) and demonstrated that these two dimensions independently predict variance in trait anxiety (Rudaizky et al., 2012). However, whether dimensions of emotional reactivity and perseverance underlie individual differences in trait negative and positive emotion more generally remains an open question.

The current research aimed to: 1) develop a measure of the hypothesized dimensions of emotional reactivity and perseverance (for both positive and negative emotion), 2) determine whether the emotional reactivity and perseverance subscales account for unique variance in trait PA and NA, and 3) investigate if individual differences in emotional reactivity and perseverance are differentially associated with symptoms of depression, anxiety, and stress.

2. Study 1: The Emotional Reactivity and Perseveration Scale

Study 1 aimed to establish the basic psychometric properties (structure, internal consistency, and test-retest reliability) of a measure of emotional reactivity and perseverance (adapted from the PANAS – see methods section below for a description) and determine whether the proposed reactivity and perseverance dimensions are independently associated with trait PA and NA.

2.1. Method

2.1.1. Participants

The baseline (T1) sample comprised 90 adults between 18 and 52 years of age ($M = 25.31$, $SD = 5.57$). Of these, 29 (32.2%) were male and 61 (67.8%) were female. The majority were current university students ($n = 75$, 83.3%). Of the sample 27 (30.0%) reported a prior diagnosis of a mental illness, most commonly a depressive disorder ($n = 13$) or an anxiety disorder ($n = 10$). Participants were re-assessed one week later (T2). Of the 51 (56.7%) participants who completed the T2 assessment, 19 (37.3%) were male and 32 (62.7%) were female. When compared with participants who only completed the T1 assessment, participants who completed both assessments did not differ significantly in terms of age, gender, history of mental health problems, positive and negative affect, or emotional reactivity and perseverance.

2.1.2. Measures

2.1.2.1. Positive and negative affect. Trait affect was measured using the dispositional version of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a 20 item scale measuring both PA (e.g. proud, inspired) and NA (e.g. nervous, distressed). Using a 5 point likert scale (0: *Very slightly*; 4: *Extremely*) respondents rate the extent to which they 'generally' feel each emotion. The PANAS demonstrates good internal consistency for both the PA ($\alpha = 0.88$) and NA ($\alpha = 0.87$) subscales (Watson, Clark, & Tellegen, 1988). Internal consistencies were excellent in the current sample ($\alpha = 0.89$ – 0.92).

2.1.2.2. Emotional reactivity and perseverance. Emotional reactivity and perseverance were measured using an adapted version of the PANAS, the Emotional Reactivity and Perseveration Scale (ERPS). The ERPS is a 40-item scale that retains the original 20 emotions of the PANAS;

however, the instructions and response options have been adapted to reflect reactivity and perseverance (see Appendix). To assess reactivity, respondents 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*; 4: *extremely likely*). To assess perseverance, participants were asked "When you experience 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 are summed to provide separate indices of positive reactivity, perseverance of positive emotion, negative reactivity, and perseverance of negative emotion.

2.1.3. Procedure

Upon receipt of ethical approval, the study was advertised on an online booking system for undergraduate psychology students interested in participating in research for course credit. Additional recruitment strategies included advertising the study via social media (e.g. Facebook), the posting of advertisements on notice boards, through snowballing and via personal networks. Participants were fully informed as to the nature of the study, and were invited to complete the confidential online survey in their own time. At T1 participants completed the PANAS followed by the ERPS. Only the ERPS was completed at T2 (to assess test-retest reliability of the new measure).

2.2. Results

With the exception of the assessment of test-retest reliability, all analyses were conducted using data collected at T1. Rates of missing data ranged between 0 and 5% and were missing completely at random for both positive and negatively-valenced items [Little's Tests: $\chi^2(170) = 191.64$, $p = 0.122$; $\chi^2(193) = 179.18$, $p = 0.754$]. Given low rates of missing data and the fact that data were missing completely at random, missing data were imputed using the expectation maximisation algorithm in SPSS 22.

2.2.1. Principal components analyses of the ERPS

Due to the small sample, principal components analyses were conducted separately for positive and negative items. Given expected correlations between the emotional reactivity and perseverance dimensions an oblique rotation was used. The Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's Test of Sphericity indicated that the sample was adequate for both the positive [KMO = 0.90; Bartlett's Test: $\chi^2(190) = 1328.55$, $p < 0.001$] and negative items [KMO = 0.91; Bartlett's Test: $\chi^2(190) = 1846.39$, $p < 0.001$]. Eigen values (≥ 1), visual examination of the scree plots, and parallel analyses (with 1000 samples; Courtney, 2013; O'Connor, 2000), were used to determine the number of components to extract. Items were included if they loaded unambiguously on a component (loadings ≥ 0.40), were conceptually coherent (communalities ≥ 0.40), and did not cross-load on components. In the initial PCA, four components with eigenvalues greater than one emerged when analysing positive items and three components with eigenvalues greater than one emerged when analysing negative items. However, these components were structurally unclear and included numerous cross-loading items. In contrast, visual examination of the scree plots suggested a clear two component solution (for both positive and negative items). The parallel analyses confirmed that two components be retained for positive items. For negative items, Horn's (1965) parallel analysis suggested a single component while Velicer's (1976) minimum average partial test (MAP) suggested two components. Taken together, the scree plots, the results of the parallel analyses, and the conceptual clarity of components indicated a two component solution for both positive and negative items. This two component solution accounted for 61% of the total variance in positive items, 70% of the total variance in negative items, and mapped directly onto the hypothesized emotional reactivity and perseverance subscales (Table 1). The emotional reactivity and

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