



Neuroticism, negative affect, and negative affect instability: Establishing convergent and discriminant validity using ecological momentary assessment

Drew J. Miller, David D. Vachon, Donald R. Lynam *

Department of Psychological Sciences, Purdue University, West Lafayette, IN 47907, United States

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ABSTRACT

Few investigations have examined the role of affective instability within a broad model of general personality functioning. The present study employed self-report and ecological momentary assessments (EMA) to examine the relations between self-reported Five-Factor Model Neuroticism, EMA average negative affect, and EMA negative affect instability. Results suggest that Neuroticism and negative affect instability are related yet distinct constructs, and that Neuroticism better represents average negative affect across time. Results also suggest that negative affect instability is related to low Agreeableness and specific externalizing facets of Neuroticism, such as Angry Hostility and Impulsiveness. The implications of these findings and potential areas for future research are discussed.

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1. Introduction

Negative affect (NA) plays an important role in many forms of Axis I and Axis II psychopathology (Clark, Watson, & Mineka, 1994; Watson, 2005). Models of general personality functioning typically contain a factor (e.g., neuroticism, negative emotionality) that represents a stable predisposition to NA states. Although much research suggests that NA is associated with a range of Axis I (Clark, 2005) and Axis II disorders (Bagby, Costa, Widiger, Ryder, & Marshall, 2005; Lynam & Widiger, 2001), some researchers have argued that affective instability plays a more important role in several forms of psychopathology (e.g., borderline personality disorder; Trull, Solhan, Tragesser et al., 2008) and may not be sufficiently captured by general models of personality (Kamen, Pryor, Gaughan, & Miller, in press; Miller & Pilkonis, 2006). The current study explores the latter claim by examining the relations between average NA, affective instability, and stable traits from the Five-Factor Model (FFM) of personality.

Affective instability has been defined as a dynamic process involving three components: extreme shifts in mood, exaggerated reactivity to environmental stimuli, and an ephemeral, fluctuating mood course (Trull, Solhan, Tragesser et al., 2008). Given the complexity of NA instability and its conceptual departure from the more general “predisposition to negative affect states” found in basic personality models, it is possible that these basic models fail to capture an important aspect of psychopathology (Miller & Pilkonis, 2006). In fact, early evidence suggests that affective instability pro-

vides unique prediction of functioning even after controlling for Neuroticism (Bagge et al., 2004). One explanation is that while structural models of personality capture average levels of behavior, attitudes, values, desires, and affective states, they neglect the dynamic processes that occur between the individual and the environment over time (e.g., Ormel, Rosmalen, & Farmer, 2004). Ormel et al. (2004), for example, suggest that Neuroticism items typically lack a well-defined time frame; use vague qualifiers of frequency, intensity, and duration; lack relevance/importance; overlap too much with symptoms of depression and anxiety; and are non-informative because Neuroticism reflects a person’s mean level of distress over an extended period of time.

The extent to which NA instability is captured by NA trait terms from general models of personality (e.g., Neuroticism) remains unresolved. Despite conceptual divergences between NA instability and Neuroticism, empirical divergences are inconsistent. For example, Clarkin, Hull, Cantor, and Sanderson (1993) found labile affect, as measured by the semistructured Structured Clinical Interview for DSM-III-R (SCID-II; Spitzer, Williams, Gibbon, & First, 1990), to be nonsignificantly related to the five domains and six Neuroticism facets of the NEO PI. Also using the NEO PI and SCID-II, however, Miller and Pilkonis (2006) found their measure of affective instability (a composite of four interview items) to be significantly positively related to Neuroticism and negatively related to Agreeableness. Similarly, employing two self-report measures (the DAPP-BQ for affective lability and the 4DPT for general personality), van Kampen (2002) found affective lability to be strongly positively related to Neuroticism and Insensitivity (the inverse of NEO PI Agreeableness; see van Kampen, 2002). Each of these studies defined and measured affective instability differently,

* Corresponding author.

E-mail address: dlynam@psych.purdue.edu (D.R. Lynam).

and all shared several limitations. First, these studies focused solely on Neuroticism. Although nominally Neuroticism would seem to be the seat of negative emotions, other dimensions of the FFM have been shown to be related to concurrent and future negative affective experience (Rolland & De Fruyt, 2003). Second, two of the studies examined personality at the level of the higher-order domain score and not at the level of individual facets; however, resolution is likely to be much better at the facet-level. Lastly, all studies utilized self-report or interview-based measures, which fail to truly represent the dynamic, temporal aspect of affective instability.

More recent research has explored the other NEO PI-R domains in more detail (Kamen et al., *in press*) and some has addressed the dynamic, temporal aspect of affective instability by employing a new methodology – Ecological Momentary Assessment (EMA; see Trull, Solhan, Tragesser et al., 2008). With respect to relations between NEO PI-R domains and affective instability, results have shown significant interactions between Neuroticism and other domains to predict affective instability, significant relations between Agreeableness and affective instability across two measurement methods (Miller & Pilkonis, 2006; Trull, Solhan, Hallgren et al., 2008), and small to moderate relations between Extraversion, Openness, Conscientiousness, and affective lability/instability (Kamen et al., *in press*). The use of EMA has also provided new means to address state (aggregated) and trait (Neuroticism) negative affect convergence. Research has generally shown aggregated state and trait negative affect to be strongly related (De Gucht, Fischler, & Heiser, 2004), but in some studies, relations have been moderate (S. Armeli, personal communication, January 7, 2009; Watson, Clark, McIntyre, & Hamaker, 1992). Although recent studies have addressed NEO PI-R domains and the dynamic process of affective instability in more detail, few studies have examined the convergence between aggregated state and trait negative affect and no study has addressed Neuroticism and affective instability in concert or explored specific facets of NEO PI-R domains outside of Neuroticism.

1.1. Current study

The current study examined the relations between average negative affect (NA), NA instability, and FFM traits. Previous studies focusing on affective instability have used self-report measures (e.g., PAI Borderline scale, Affective Lability Scale; see Kamen et al., *in press*; Tragesser, Solhan, Schwartz-Mette, & Trull, 2007) or diagnostic interviews (e.g., Structured Clinical Interview for DSM-III-R Personality Disorders; Clarkin et al., 1993; Miller & Pilkonis, 2006), which are limited in that they rely on retrospective recall, lack internal consistency, and do not provide the respondent with time frames (i.e., Over the last week? month? year?) or thresholds (i.e., How many times must this experience occur in order for it to be considered “characteristic”). Technological advances in the last several years have enabled the use of electronic diaries for Ecological Momentary Assessment (EMA). This method provides several advantages over self-report methods, including minimizing effects unique to recall and recording more accurate dates and times of events (Piasecki, Hufford, Solhan, & Trull, 2007). EMA also provides better estimates of mean levels of subjective variables (e.g., mood) because they are not influenced by rare but salient moments of extreme experiences (Piasecki et al., 2007).

Although recent investigations have successfully linked affective instability to various forms of psychopathology using this methodology (e.g., borderline personality disorder, Trull, Solhan, Tragesser et al., 2008), none have employed it to examine the relations between trait, state, and labile NA. In sum, the current study used a combination of self-report and EMA methods to build on the previous finding that NA instability and Neuroticism are distinct, yet re-

lated constructs (Kamen et al., *in press*; Miller & Pilkonis, 2006), examined the convergent validity of average NA with Neuroticism, compared average NA and NA instability in their relations to all FFM domains and facets, and explored whether specific forms of NA and NA instability bear differential relations to FFM domains and facets. Understanding where affective-related constructs fit into a general model of personality will provide insight into the assessment of affect-related constructs and corresponding psychopathology.

2. Method

2.1. Participants

Participants were 79 (25 men, 54 women) undergraduate students at a large, Midwestern university recruited through an introductory psychology pool and given course credit for their participation. Although age and race were not reported, the university's undergraduate study body is 82% Caucasian, 7% International, 5% Asian-American, 3% African-American, 2% Hispanic/Latino, and 1% Native American.

2.2. Self-report measures

2.2.1. NEO personality inventory – revised (NEO PI-R)

The NEO PI-R (Costa & McCrae, 1992) is a 240-item self-report inventory designed to measure the components of personality as outlined by the Five-Factor Model. The instrument contains five personality domains: Neuroticism (N), Extraversion (E), Openness (O), Agreeableness (A), and Conscientiousness (C), which each contain six subscales or “facets”. Internal consistencies in the present sample for the N, E, O, A, and C domains were .86, .86, .88, .86, and .87, respectively. Facet scale internal consistencies ranged from .53 (A6: Tender-Mindedness) to .83 (O5: Ideas) with a mean of .68.

2.3. Ecological momentary assessment measures

2.3.1. Negative affect and affect variability

NA consisted of several items taken from the PANAS (Watson, Clark, & Tellegen, 1988) (guilty, ashamed, nervous, irritable) as well as several items similar to those on the PANAS, including worried, sad, gloomy, angry, stressed, and overwhelmed. Participants were asked to rate their current affective state using a 5-point Likert scale ranging from 1 (not at all) to 5 (very much) (e.g., At this present moment, I feel...irritable). Average NA across the week was calculated by averaging each participant's responses to NA items at each assessment and then averaging across all assessments. Although few participants completed questionnaires at all 56 time points, there were only missing data between and not within assessments. Thus, averages were calculated across all completed questionnaires. In the current sample, the internal consistency of NA was .93.

Negative affective instability was defined in the current study as “extreme and frequent fluctuations” in NA over time (Trull, Solhan, Hallgren et al., 2008). Because using NA variance as a measure of instability fails to take into account temporal dependency of affect ratings, we used the mean-squared successive difference (MSSD) as a measure of instability. The MSSD takes into account the amplitude and frequency of change as well as the temporal dependency of affect ratings and results in the following equation:

$$\text{MSSD} = \frac{1}{N-1} \sum_{i=1}^{N-1} (x_{i+1} - x_i)^2$$

where x indicates the time at i and N indicates the number of assessments. To calculate the average NA instability, MSSDs for each NA item were averaged.

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