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# The influence of neuroticism on concurrent symptom reporting: A multilevel modelling approach

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#### **Abstract**

The current study explored the influence of neuroticism on the diurnal pattern of symptom reporting. Participants were 548 individuals from 169 families. Using a computer-assisted self-monitoring procedure, individuals reported their concurrent somatic symptoms six times per day for seven consecutive days. Neuroticism was assessed separately in a follow-up questionnaire. We used a generalized linear models approach for multilevel-analysis, and analysed a four level model with observations within days, days within individuals, and individuals within families. Results show no main effect for neuroticism, but an interaction of neuroticism with time of the observation. Individuals average in neuroticism show a curvilinear pattern with increased symptom reporting in the morning and in the evening, and less during the day. Individuals with low levels of neuroticism show a similar but more attenuated pattern. Individuals high in neuroticism, however, show a constant level of symptom reporting throughout the day, with no decrease in the middle of the day. These findings suggest that neuroticism results not so much in exaggerated symptom reporting but in a different diurnal pattern of concurrent symptom reporting.

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Keywords: Neuroticism; Concurrent symptom reporting; Daily pattern; Multilevel analysis

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#### 1. Introduction

For the last 20 years, neuroticism and negative affectivity have been the most consistent predictors of symptom reporting especially in retrospective questionnaires (e.g. Costa & McCrae, 1980; Vassend & Skrondal, 1999; Watson & Pennebaker, 1989; Williams & Wiebe, 2000). In the last decade, a much weaker association has also been shown with concurrent symptom reports (Cohen, Doyle, Skoner, & Fireman, et al., 1995; Fahrenberg et al., 1999; Feldman et al., 1999; Kolk et al., 2003; Larsen, 1992; Neitzert et al., 1997; Williams et al., 2002). However, only rarely have the concurrent measures been analysed without aggregating. The current study was designed to examine the influence of neuroticism on concurrent symptom reporting with multiple measures of symptom reporting per day. This procedure allowed an examination of differences between individuals high and low in neuroticism not only on their average level of symptom reporting but in their daily pattern.

### 1.1. Concurrent symptom reporting and its association with neuroticism

Neuroticism is a stable personality characteristic associated with the experience of negative emotions. Often, individuals high in neuroticism are very ruminative, especially regarding their health and well-being. Neuroticism is often assessed as emotional instability (e.g. Freiburg Personality Inventory, Fahrenberg, Hampel, & Selg, 2001) or negative affectivity (e.g. the trait measure of the State-Trait Anxiety Inventory, Spielberger, Gorsuch, Lushene, Vagg, & Jabobs, 1983). Because in the published literature the term neuroticism is still widely used as a superordinate concept of emotional stability and negative affectivity, in the current paper the term neuroticism will be used.

In contrast to retrospective studies, prospective studies of symptom reporting show a smaller or no association with neuroticism. A higher report of somatic symptoms is usually found in reports assessed at the end of the day (diary approach; Cohen et al., 1995; Feldman et al., 1999; Larsen, 1992). Studies using an experience or time sampling approach on the other hand, find an association between emotional state and symptom reporting but no (Brown & Moskowitz, 1997), or only a very small association with neuroticism (Fahrenberg et al., 1999; Williams et al., 2002). In diary studies, individuals usually report their symptoms for the past 24 hours. Even if retrospection is abridged in this approach, it is still present to a certain degree. The phenomenon that even in short retrospection, experiences are recalled as worse than they really were, was called retrospection effect (Fahrenberg et al., 1999; Kaeppler & Rieder, 2001).

These findings suggest that neuroticism only has an effect on health measures if these are recalled from memory; in contrast, emotional states may affect the experience of a somatic event. Nonetheless, high and low neurotic individuals may differ in their somatic experience because of a different prevalence of positive and negative emotional states. While individuals' average in neuroticism have an up and down in their emotions during the day (Wilhelm, 2001), high scoring neurotics may experience negative states more frequently, which increases attention to the body, makes them more ruminative about somatic experiences, and lets them discover somatic symptoms. Differing daily patterns in neurotics have been found for various psychological characteristics such as emotional states and performance indices (Fahrenberg et al., 1999; Kaeppler & Rieder, 2001; Wilhelm, 2001), and may also be found in symptom reporting.

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