



Individual differences in core affect reactivity

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ABSTRACT

At the basis of any emotional phenomenon lies core affect, defined as a simple, volatile feeling that is a blend of hedonic and arousal values. The present study was intended to increase our understanding of core affect reactivity by investigating within-person relationships between two daily event characteristics and core affect, and individual differences in such relationships. For 7 days, 73 participants described their core affect nine times each day. Simultaneously, they rated the impact and valence of the most significant event that had occurred since the previous measurement occasion. Multilevel analyses found that the perceived event characteristics under study were significantly related to both core affect dimensions. Furthermore, individual differences in extraversion and neuroticism played a significant role in core affect reactivity. The different patterns of results for these traits suggest that omnibus models explaining how traits per se interact with situational forces to influence behaviour may need to be revised.

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1. Introduction

At the basis of any emotional phenomenon lies core affect, defined by Russell as “a neurophysiologic state that is consciously accessible as a simple, non-reflective feeling that is an integral blend of hedonic (pleasure–displeasure) and arousal (sleepy–activated) values” (Russell, 2003, p. 147). As such, the term core affect refers to the most elementary consciously accessible affective feelings that need not be directed at anything. At each moment in time, an individual’s core affect can be depicted as a single point in a two-dimensional grid. The hedonic dimension of this grid ranges from pleasure through a neutral point to displeasure, and represents how well one is doing; the arousal dimension ranges from sleep through a neutral point to extreme excitement, and represents how energized an individual feels.

Core affect is not assumed to be stable but volatile: It moves through its constituting two-dimensional space, reflecting how one feels throughout everyday life. Moreover, core affect is subject to various influences (Russell & Feldman-Barrett, 1999). A full understanding of core affect therefore requires understanding its dynamics, including the different sources of core affect variability and their respective influences.

An important focus of studies on within-person variability of emotions has been the within-person relationship between daily events and emotions, or emotional reactivity. The majority of these studies have concerned changes in daily affect as a function of po-

sitive and negative daily events (e.g., David, Green, Martin, & Suls, 1997; van Eck, Nicolson, & Berkhof, 1998). More importantly, several studies have found individual differences in the within-person relationships between daily events and daily affect in terms of neuroticism or extraversion (e.g., Lucas & Baird, 2004; Suls & Martin, 2005) and measures of well-being such as depression (e.g., Nezlek & Plesko, 2003). For example, Lucas and Baird (2004) found reliable evidence that extraverts were happier than introverts in both neutral and positive mood conditions, whereas Suls and Martin (2005) showed that persons who scored high (versus low) in neuroticism tended to experience more severe emotions in response to daily stressors.

These results suggested that it would be useful to examine individual differences in the relationships between core affect and characteristics of the events people experience in their everyday lives. Such within-person relationships might vary straightforwardly as a function of dispositional measures, but individual differences might also show up in more complex ways. For example, as suggested by Marshall and Brown (2006), individual differences in emotional reactivity might vary as a joint function of dispositional factors and the strength of situational characteristics. In their presentation of the TASS model (traits as situational sensitivities), Marshall and Brown (2006) found support for the hypothesis that dispositional factors would be more influential when situational characteristics are moderate in strength compared to when situational characteristics are either strong or weak.

In this article we focus on two different types of event characteristics reflecting the hedonic and arousal dimensions of core affect, the perceived valence and impact of an event. Consider, for

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example, an individual meeting with a friend *Y* and this friend starts talking about his new job. If we ask individual *X* to rate this event, he would probably rate it as a positive event with a low impact. Now, consider the situation where an employer accuses *X* of having made a mistake. *X* would probably rate this as a negative event with more impact than the previous example because of its greater importance and relevance. It is important to note that the perceived valence and impact of an event are conceptualized as independent.

In general, we hypothesize that event valence is positively related to the hedonic dimension of core affect, in line with previous findings of Marco, Neale, Schwartz, Shiffman, and Stone (1999), and van Eck et al. (1998). We further hypothesize that more impactful events result in higher arousal levels of core affect, similar to the relationships between emotions and the primary appraisals of event importance and motivational relevance, as described by Smith and Lazarus (1990) and Sonnemans and Frijda (1995).

Moreover, we examined individual differences in the relationships between event characteristics and core affect. Our specific research questions concerned individual differences in extraversion and neuroticism.¹ With regard to *extraversion*, we based our expectations in part on research and theory concerning physiologically based personality theories (e.g., Beauducel, Brocke, & Leue, 2006; Eysenck, 1967; Eysenck & Eysenck, 1985). Broadly speaking, these theories suggest that introverts have higher levels of brain activity in the ascending reticular activating system (ARAS) than extraverts, and as a consequence, introverts display more reactivity on the arousal dimension of the affective circumplex. Based on these theories, different predictions could be made for the present study. Base-line arousal models suggest a main effect: introverts should be more aroused than extraverts, regardless of the impact of an event. Taking into account individual differences in reactivity suggests one of two interactions. (1) Introverts and extraverts should be similarly aroused when events have no impact, but introverts should be more aroused when there is some impact. (2) Introverts should be more aroused than extraverts, and this difference should increase as event impact increases.

With regard to *neuroticism*, our research questions concerned relationships between the hedonic dimension and neuroticism. Based on previous research different predictions could be made for the present study. Consistent with research that has found relationships between neuroticism and experienced negative emotions such as anxiety (e.g., Gomez & Francis, 2003) and negative emotionality (Larsen & Ketelaar, 1991), we had reason to expect a main effect of neuroticism. Overall, we expected that more (as compared to fewer) neurotic individuals would be more likely to report feelings in the negative half of core affective space. Moreover, we expected this negative relationship between neuroticism and the hedonic dimension across all levels of event impact. In addition, as suggested by Marshall and Brown (2006), we examined the possibility of an interaction effect to occur between neuroticism and impact. Neuroticism might be negatively related to pleasure in the case of low or moderate impact events, whereas they might not be related for high impact events because the strength of the situation would override such individual differences. Individual differences might also be weak in situations without any impact. Such expectations are also suggested by Snyder and Ickes (1985) and Mischel (1977) who stated that traits have their greatest predictive ability when situations provide just enough provocation to

evoke trait-relevant reactions in those who score high on a trait but not in those who score low. Taking all this together, we had reason to expect that relationships between neuroticism and pleasure would be strongest in situations of moderate impact.

We examined these questions by conducting an experience sampling study in which participants described their experienced core affect and the valence and impact of events at random moments during their daily activities. They also completed various dispositional measures. There are numerous advantages of using experience sampling to examine the types of relationships in which we were interested. These include diminished reliance on memory and a consequent reduction of distortion (e.g., Stone et al., 1998) and the ability to sample variables in a broad range of every day circumstances, increasing ecological validity (Feldman-Barrett & Barrett, 2001).

2. Method

2.1. Participants

Participants were 73 students from the University of Leuven. The sample consisted of 26 men and 47 women. On average, participants were 21.22 years old (SD = 2.10).

2.2. Measures of core affect and event characteristics

Core affect was measured with the Affect Grid (Russell, Weiss, & Mendelsohn, 1989), a visual 9 × 9 two-dimensional grid, with a neutral (fifth) row and a neutral (fifth) column. Unpleasant/pleasant constitutes the horizontal and arousal/sleepiness the vertical dimension of this grid. Fig. 1 provides an example of the Affect Grid. Event impact was measured with a 7-point scale with 0 = nothing impactful happened, and 6 = extremely impactful, and event valence with a 7-point scale with -3 = negative, 0 = neutral, and 3 = positive.

2.3. Personality measures

The Dutch version of the NEO-FFI (Hoekstra, Ormel, & De Fruyt, 1996) was used to measure neuroticism and extraversion. All items

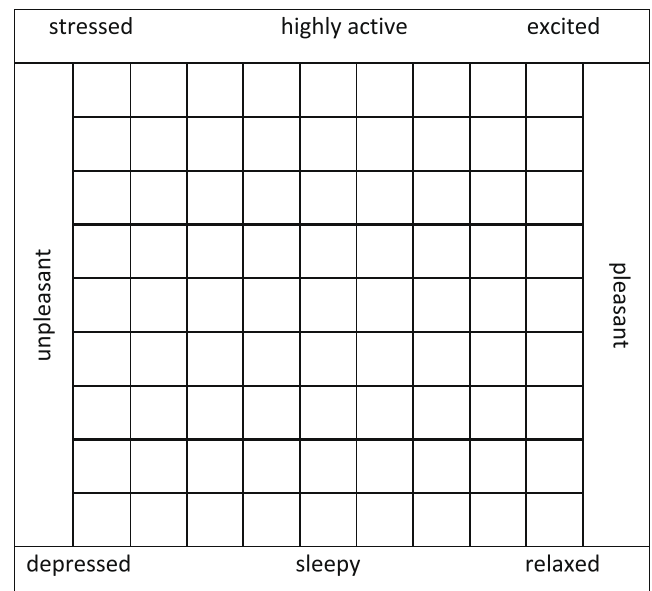


Fig. 1. The Affect Grid used to assess momentary core affect (adapted from Russell et al. (1989)).

¹ To simplify the presentation of the research questions, we use the terms "introverts" and "extraverts" to refer to those low and high (respectively) on the personality dimension of extraversion. We use a similar convention when discussing neuroticism. In neither case are we assuming a categorical or discontinuous distribution of the trait.

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