Journal of Research in Personality 45 (2011) 372–384

Contents lists available at ScienceDirect

Journal of Research in Personality

journal homepage: www.elsevier.com/locate/jrp

Integrating personality, daily life events and emotion: Role of anxiety and positive affect in emotion regulation dynamics

Anne Congard [a,*], Bruno Dauvier [a], Pascal Antoine [b], Pierre-Yves Gilles [a]

[a] PsyCLE Research Center, University of Provence – Aix-Marseille I, 29, Avenue Robert Schuman, 13621 Aix en Provence Cedex 1, France
[b] University of Lille Nord de France, 59000 Lille, France and UDL3, URECA, F-59653 Villeneuve d'Ascq, France

ARTICLE INFO

Article history:
Available online 28 April 2011

Keywords:
Emotion
Anxiety
Affect
Individual differences
Intra-individual variability
Dynamical system
Vector field
DynAffect model

ABSTRACT

We investigated the roles of anxiety and positive affect in emotion regulation, looking simultaneously at personality, daily life events, and affects. We hypothesized that individual differences in the temporal dynamics of affective experience related to trait anxiety would manifest themselves both in affective responsiveness to life events and in homeostatic regulatory forces. Data were collected from 49 adults, who rated their affective state three times a day over a 40-day period. Data were analyzed using a dynamical system model and graphical representations in the form of vector fields. Results showed that anxiety chiefly interacted with home base (attractor) positions as a function of life events. It also influenced the shape of positive affectivity trajectories in response to negative events.

1. Introduction

A fundamental characteristic of emotions and affective experiences is that they vary over time. Our lives are characterized by affective ups and downs, changes and fluctuations following the ebb and flow of daily life. Understanding the nature of the temporal dynamics of affect and emotion, and the processes that underpin them, as well as individual differences in the patterns and regularities characterizing affect dynamics (Kuppens, Oravecz, & Tuerlinckx, 2010) remains one of the most important challenges in the study of emotion (Scherer, 2009).

It is important to study the dynamics of emotional fluctuations, as this allows us to predict observable behaviors more accurately (e.g., Eid & Langeheine, 1999; Ghisletta, Nesselroade, & Featherman, 2002; Nesselroade, 1988, 2001). A better understanding of the mechanisms that underpin emotion regulation could help us gain a clearer idea of individual trajectories and of the long-term impact of these mechanisms on psychological health and well-being (Dodge & Garber, 1991). Given that their impairment can account for various personality disorders, including depression and anxiety, they constitute key factors in numerous psychiatric diagnoses (Murray, Allen, Trinder, & Burgess, 2002; Russell, Moskowitz, Zuroff, Sookman, & Paris, 2007).

There has been a growing interest in the dynamics of emotion regulation processes (John & Gross, 2007; Vansteelandt, Van Mechelen, & Nezlek, 2005) and more and more researchers are now starting to examine the patterns and regularities that drive the dynamics of affect (Kuppens et al., 2010). The main aim of the present study was to undertake the simultaneous investigation of affect, personality and daily life events (Nezlek & Kuppens, 2008), and more specifically to study the role of anxiety in variations in positive and negative affect in reaction to events, within the framework of a model of affect dynamics (DynAffect; Kuppens et al., 2010). This model formalizes three processes involved in affective fluctuations and seems to offer a heuristic conceptual framework for exploring individual differences. We refer to this framework throughout our paper. After describing the DynAffect model (Kuppens et al., 2010) in some detail, we tackle the role of personality in affective fluctuations, focusing on trait anxiety and its links with the perception of daily life events. We then attempt to pinpoint the role of positive affect in emotional dynamics.

1.1. A dynamical system model for the study of individual differences in affective fluctuations

The DynAffect model developed by Kuppens et al. (2010) treats the affect system as an open, dynamic system featuring three main sources of interindividual variations: the coordinates of the home base – a baseline attractor state or benchmark –, the range of

---

[*] Corresponding author. Address: Université de Provence – Aix-Marseille I, Centre de Recherche PsyCLÉ (EA 3273), 29, Avenue Robert Schuman, 13621 Aix en Provence Cedex 1, France. Fax: +33 4 94 11 41 70.

E-mail addresses: anne.congard@laposte.net (A. Congard), Bruno.Dauvier@univ-provence.fr (B. Dauvier), pascal.antoine@univ-lille3.fr (P. Antoine), Pierre-Yves.Gilles@univ-provence.fr (P.-Y. Gilles).

0092-6566/$ - see front matter Crown Copyright © 2011 Published by Elsevier Inc. All rights reserved.
doi:10.1016/j.jrp.2011.04.004

affective fluctuations around this home base, and the strength of the system's homeostatic attraction force, which curbs these fluctuations brought about by internal or external processes.

This model considers affect in a two-dimensional space, with valence along the x-axis and arousal along the y-axis. The home base constitutes an equilibrium point in this two-dimensional system, serving as a specific attractor for each individual, around which the latter's affective state fluctuates. Particularly wide affective fluctuations constitute discomfort zones, motivating the individual to engage regulation processes in order to restore equilibrium and return to the home base (Russell, 2003). The basic idea, therefore, is that our affective state fluctuates around an equilibrium point, which serves as a baseline for the affective system, reflecting its expected state given the characteristics of its environment in a given period. It reflects the average emotional experience of a person in a given period. It can also be viewed as the point where the affective state would stabilize itself in a steady and homogeneous environment. In the DynAffect model, the home base position is essentially an individual characteristic. In our view, the home base position is linked to the appraisal that an individual makes of their environment. It is thus influenced by both individual and environmental characteristics.

If the first process is the affective home base, the second process is variability, referring to affective changes and fluctuations. Being an open system, our affective state is subject to dynamic-stochastic variability (Russell, 2003, 2009) resulting from the many internal and external events that influence our core affect at any given time. The extent of these variations depends on the individual. Some of us experience important emotional changes, react more strongly to the event or encounter more striking events, while others experience a life more stable emotionally.

The third process is the force exerted by the attractor, or home base. If, after a perturbation, the affective state of a person is far away from its current home base, this state will move gradually toward the home base driven by the attraction force of this home base. One can imagine this attraction, by the force exerted by a spring attached to the home base. The spring gradually returns to its initial state after being stretched, suggesting regulation processes. The intensity of this force depends on the distance between the current emotional state and the home base. The further the affective state moves away from the home base, the greater the attraction force. Whenever events open up too great a gap, this self-regulation process undertakes to redirect affect toward the system's equilibrium point. Its purpose is thus to prevent the system from reaching extreme values and, by so doing, reduce the affective fluctuations that disturb the individual's equilibrium and, by extension, his or her psychological wellbeing. The intensity of the attraction also depends on the thickness of the spring which could vary depending on the subject and relies on dispositional characteristics. A person with a hight attraction strength returns more easily to his home base. This model has shown its ability to account for emotional fluctuations in a longitudinal protocol.

The model used in this study basically replicates the framework developed by Kuppens et al. (2010), albeit with three modifications. The first difference concerns the two axes of affective space. Whereas the DynAffect model relies on the distinction between valence and arousal, we decided to take positive affect (PA) and negative affect (NA) as its two axes. This choice raised the question of the independence or bipolarity of PA and NA, which has been the subject of hot debate in the literature (Russell & Carroll, 1999; Watson & Tellegen, 1999). One of the present study's objectives was to analyze combined changes in PA and NA in reaction to daily life events and, more specifically, the likelihood of asynchrony and uncoupling between PA and NA. This amounted to assuming that there is a degree of leeway in NA–PA bipolarity and a relative independence in certain conditions (Reich, Zautra, & Davis, 2003; Zautra, Affleck, Tennen, Reich, & Davis, 2005). For this reason, we believed it was important to collect PA and NA data separately and to make them the main axes of affective space. This meant that we had to neglect variance linked to arousal to some extent, even though it could well be relevant here (Kuppens, Van Mechelen, Nezlek, Dossche, & Timmermans, 2007). A more comprehensive approach would consist in considering three dimensional affective space (PA, NA and arousal), as Stanley and Meyer (2009) recently suggested, but this would result in a far more complex model and go far beyond the scope of our research.

The second contribution deals with the concept of home base and its relation with life events. We believed that this notion could be extended, by regarding it as the result of environmental factors, as well as individual characteristics. For example, an individual might have a home base in one position corresponding to a welcoming environment characterized by a succession of positive events (e.g., a week's vacation) and in another position corresponding to a hostile environment characterized by overwhelmingly negative life events (period of considerable stress at work). In each case, therefore, the system would stabilize itself or fluctuate around a different equilibrium point with different coordinates. We therefore decided to turn the home base into a continuum, rather than a fixed point – a curve in affective space where each section would correspond to life events of a particular valence. Some of the DynAffect model's variability parameter was therefore represented by this affective "moving target". In order to track this variability, our protocol provided for the recording of daily life events at each observation. The first set of hypotheses we tested therefore concerned shifts in the home base according to daily life events and trait anxiety.

The third contribution was to take eventual coupling effect between PA and NA into account to describe individual trajectories in the affective space. In the present study, PA and NA were assumed to be governed by two distinct but connected entities. This connection could take the shape of a lateral inhibition of one on the other. Empirical results show that changes in PA and NA are negatively correlated when they are studied in dynamics (Vautier, Steyer, Jmel, & Raufaste, 2005) and this correlation is increased when the interval between observations is shorter (Diener, Smith, & Fujita, 1995).

The study of eventual coupling (Zautra et al., 2005) effects between AP and AN also allows to examine the role of positive affects in the regulation of negative emotions, which is a major objective of this research. More particularly, it is assumed that, during the recovery phase after a negative event, the occurrence of PA might contribute to a reduction of NA (Ong, Bergeman, & Bisconti, 2006). Some of us may be able to use PA in order to curb the increase in NA in the recuperation phase, this idea is detailed in the Section 1.3.

The coupling is not always complete between PA and NA. The coexistence of positive and negative affects has been shown in literature (Cacioppo, Larsen, Smith, & Berntson, 2004). The model that we used is flexible enough to highlight the effects of coupling while allowing certain independence between PA and NA and taking into account the coexistence of high levels of PA and NA found in literature (e.g., being happy and sad at the same time). Technically, this kind of coupling effect can be modeled using cross-lagged regression coefficients. The next two sections first relate the role of anxiety in the differences in affect regulation and the role of positive affect in the regulation of negative affect.

1.2. Anxiety, response to daily life events and emotion regulation

The factors involved in emotional fluctuations (subjective assessment of events, biological and environmental factors) are numerous and interconnected, and it is the outcome of this complex combination that determines affective variability over time (Fok, Hui, Bond, Matsumoto, & Yoo, 2008). Whereas the relationship between personality and affective responses has been investigated on many occasions (see, for example, Diener et al., 1995; Larsen & Ketelaar,