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RESEARCH ARTICLE

Empirical exploration of the circumplex model and subjective well-being on employees

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Abstract

The purpose of this study was to investigate the validity of the circumplex model of emotions and its relatedness with work attitudes (i.e., work engagement, job satisfaction, burnout, and workaholism). Positive affects relate to specific attitudes that enhance individuals' wellbeing (i.e., work engagement and job satisfaction) while negative emotions emerge into feelings of burnout and workaholism. The questionnaires were to a convenient sample of 178 employees. The present study approaches the proposed hypotheses as follows: first, we have conducted a principal component analysis (PCA) to determine the number of components in which affective descriptors load. Second, the confirmatory factor analysis (CFA) was used to estimate the degree of fitness of our gathered data and the 4-factor model of subjective well-being. Third, multidimensional scaling was used to map the similarity between affective descriptors as well as the circular order of affects. Last, to investigate the relatedness of affective descriptors with work attitudes, Pearson correlation has been used. Findings of our study supported the circumplex model of affects as well as their relatedness with job attitudes. Theoretical and practical contributions are also discussed.

Keywords

circumplex model of affect; affective descriptors; subjective well-being; work attitudes.

Introduction

This study tests the validity of the circumplex model of emotions (Russell, 1980) and its proposed relationships with job attitudes associated with employee wellbeing (job engagement, job satisfaction, burnout and workaholism) and explores the broader interactions of emotions at work, based on the initial circumplex model developed by Russell (1980).

Although the field of emotion research is vast and encompasses a variety of theoretical models (Izard, 1972, 1977; Nowlis, 1965; Plutchik, 1980; Russell, 1980; Schlosberg, 1952; Thayer, 1967), there are only a handful of theories that attempt to explain and define how emotions are structured in relation to job-related behaviors and outcomes (Plutchik, 1980; Russell, 1980; Warr, 1990).

The relation between emotions and job attitudes (e.g., job satisfaction, work

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engagement, burnout, workaholism) has also been studied inside a relative void of explicit models. In this context, research findings highlighted that individuals with high levels of positive emotions adopt a more positive work attitude and vice-versa in case of adverse affects (see also Brackett, Palomera, Mojsa-Kaja, Reyes, & Salovey, 2010; Clark, Michel, Stevens, Howell, & Scruggs, 2014; Ouweneel, Le Blanc, Schaufeli, & van Wijhe, 2012; Xu, Martinez, Van Hoof, Eljuri, & Arciniegas, 2016). Most research has been focused on validating various measures of wellbeing (Warr, Bindl, Parker, & Inceoglu, 2014; Watson, Clark, & Tellegen, 1988) in different work-related contexts. Structural Equation Modelling revealed approximate models of job-related affects and behaviors (Warr et al., 2014) which are a good start for further testing the relationships between emotions and job attitudes.

One of the most common approaches to defining the structure of emotions is the dimensional approach pioneered by Russell (1980). This is based on early attempts to develop a circumplex model of affect by Schlosberg (1941) which has been widely used in several settings and different contexts (Olson, 2000).

The circumplex model suggests that emotions are distributed in a two-dimensional circular space which includes the arousal (i.e., how intense the emotions are) and valence (i.e., whether positive or negative) dimensions. The vertical axis is represented in this model by arousal, while the horizontal axis consists of valence. Both dimensions have been further identified using factor analysis and multidimensional scaling techniques (Russell, 1980, 2003). This model has been used to determine affective states, emotions transmitted through facial expressions and emotions conveyed through words (Remington, Fabrigar, & Visser, 2000).

In a circumplex model, the similarity between two affective states is based on their distance from one another on the perimeter of the circle (Figure 1). The closer two emotions are on this perimeter, the more similar they are. For example, "excited" and "aroused" are more similar than "content" and "aroused," and the adjectives of the first pair are therefore placed closer to each other on the perimeter of the circle than the adjectives of the second pair. The model implies that pairs of affective states separated by only a few degrees are positively correlated. At a 90° separation, emotions are assumed to be uncorrelated, while when approaching 180° (e.g., happiness and sadness) affective states should be negatively related to one another (Larsen & Diener, 1992; Russell, 1980; Russell & Carroll, 1999; Tellegen, Watson, & Clark, 1999; Watson & Tellegen, 1985).

Figure 1. The original circumplex model of affect. Emotions are posed circularly in space. Adapted from "A Circumplex Model of Affect", by Russell J. A., 1980, *Journal of Personality and Social Psychology*, *39*, p. 1168.

The circumplex model of affective states describes four affective quadrants labelled as HAPA (high-activated positive affect or "Enthusiasm") situated in top-right quadrant, HANA (high-activated negative affect or "Anxiety" situated in top-left quadrant), LAPA (low-activated positive affect or "Comfort") situated in bottom-right quadrant, and LANA (low-activated negative affect or "Depression") (Warr et al., 2014). Variants of this model can also be found in other studies (Barrett & Russell, 1999; Bush, 1973; Dittmann, 1972; Neufeld, 1975, 1976; Plutchik, 1991; Remington et al., 2000; Van Katwyk, Fox, Spector, & Kelloway, 2000; Warr, 1987, 1990).

Before investigating the relatedness of the circumplex model with job attitudes, we first investigate whether our gathered data support such model. Despite its popularity, the circumplex model of emotions is not without its critics (Russell, 2003). One of the main concerns is represented by the construct validity of the circumplex model. As contextual variation is undoubtedly reported in the literature (e.g., Roberts & Wedell, 1994; Warr, 1987, 1990), our hypotheses are applied to Romanian working samples. To address the construct validity, the first part of the present study focuses on testing several hypotheses of the circumplex model, as described by Russell (1980, 2003), on a Romanian sample:

Hypothesis 1: The pleasantness–unpleasantness and arousal–sleep dimensions account for the major proportion of variance among measured emotions.

Hypothesis 2: The bifactorial structure of affect has two independent bipolar factors (pleasantness–unpleasantness and arousal–sleep).

Hypothesis 3: Emotions are a combination of the pleasure and arousal dimensions and therefore are related to each other in a roughly circular structure.

The circumplex structure of work-related subjective well-being

Russell's (1980) circumplex model of emotions has been previously loosely linked to job attitudes (Warr et al., 2014). We will mainly focus on the investigation of possible relations of the various job-related attitudes associated with subjective wellbeing, with positive and negative emotions of the circumplex.

Subjective wellbeing (SWB) at work has generated significant interest (Bakker & Oerlemans, 2011). The theoretical model is based on the relationship between work attitudes and SWB and maps various types of job attitudes, such as burnout, workaholism, job satisfaction and work engagement, to the circumplex above model of emotions (Bakker & Oerlemans, 2011). There is a growing literature related to the negative and positive outcomes of various job attitudes. For example, workaholism and burnout have been shown to have primarily adverse outcomes (Maslach, Schaufeli, & Leiter, 2001; Vodanovich, Piotrowski, & Wallace, 2007), while work engagement and job satisfaction have been shown to have primarily positive outcomes (Bakker & Demerouti, 2008; Connolly & Viswesvaran, 2000).

A number of four job attitudes are usually mentioned about the emotion circumplex: job satisfaction, work engagement, burnout, and workaholism.

Job satisfaction is probably the most studied indicator of SWB, in part due to its durability. One of the most common conceptualizations is that of Spector (1997), according to whom job satisfaction is explained merely by how people feel about their jobs in general, and about different aspects of their jobs. It is the extent to which people like (satisfaction) or dislike (dissatisfaction) their jobs.

Work engagement was initially considered to be characterized by energy, involvement, and efficacy, directly opposite dimensions of professional exhaustion. Based on these assumptions, work engagement was assessed using the opposite pattern of scores from the three dimensions of Maslach Burnout Inventory (Maslach, Jackson, Leiter, Zalaquett, & Wood, 1997). However, in recent studies, work engagement is conceptualized as an independent, distinct, definite concept, which correlates negatively with burnout

(Bakker & Demerouti, 2008). Thus, work engagement is defined as a positive state related to work, characterized by vitality, dedication, and absorption (Schaufeli, Bakker, & Salanova, 2006).

Burnout has received attention as the "bad" end of employee attachment (Maslach et al., 1997). Therefore, burnout may also be regarded as detachment. Burnout consists of three interdependent dimensions: emotional exhaustion, depersonalization (cynicism) and perceived reduction in personal accomplishment (Maslach & Jackson, 1981; Maslach, Jackson, & Leiter, 1981).

Workaholism is a negative psychological state characterized by working excessively and compulsively mostly due to an internal drive that individuals find it hard to resist (Schaufeli, Shimazu, & Taris, 2009).

The theoretical framework proposed by Bakker & Oerlemans (2011) is an attractive circular structure representation of four well-being indicators in the context of occupational health psychology, which was assimilated as a point of reference in other studies (Bakker, Albrecht, & Leiter, 2010, 2011; Parker & Griffin, 2011; Schaufeli, 2013).

Nevertheless, few previous studies have focused on the empirical exploration of the different quadrants of the adapted circumplex model (Bakker & Oerlemans, 2011), while only two known studies focus on all four simultaneously (Mäkikangas, Rantanen, et al., 2015; Salanova, Del Líbano, Llorens, & Schaufeli, 2014). Although cited as a confirmatory study of validation of the circumplex model of employee wellbeing (Innanen, Tolvanen, & Salmela-Aro, 2014; Mäkikangas, Schaufeli, et al., 2015), Salanova and colleagues (2014) derived their findings using clustering analyses to establish a typology of employee well-being. Mäkikangas and colleagues (2015) used confirmatory factor analysis to ensure that each of the occupational well-being variables represented unique psychological constructs. The spatial representation and the distance space between the factors was not the aim of these studies. The present study addresses this critical gap in the literature.

The four occupational well-being concepts represent different states of pleasantness and activation that can be used to describe the multifaceted nature of employee well-being (Bakker & Oerlemans, 2011), as seen in Figure 2.

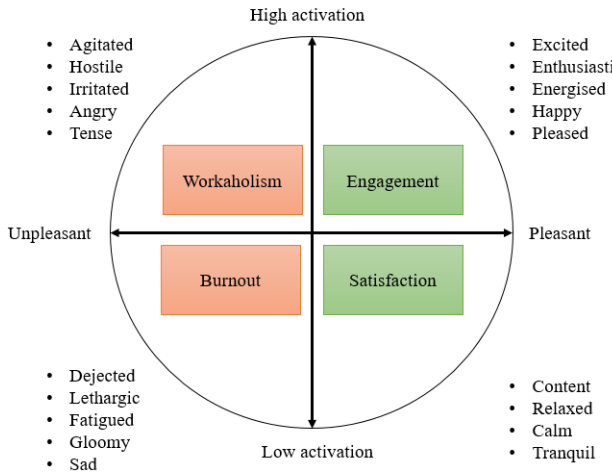

Figure 2. A two-dimensional view of work-related SWB indicating related affects of work attitudes. Adapted from " Subjective well-being in organizations" by A. B. Bakker and W. G. M. Oerlemans, 2011, chapter in K. Cameron & G. Spreitzer (Eds.) (2011), *Handbook of Positive Organizational Scholarship*, p. 178–189. Oxford University Press .

Accordingly, the circumplex model of subjective wellbeing at work assumes that every dimension (workaholism, job satisfaction, work engagement, burnout) has a distinct affective state pattern, which enables the plotting of the variables on the circumference of a circle defined by two orthogonal dimensions: pleasure-displeasure and activation-deactivation. For instance, employees who experience mainly negative emotions may suffer from burnout (low activation) or workaholism (high activation), whereas employees who mainly experience positive emotions may feel satisfied (low activation) or engaged (high activation) (Bakker & Oerlemans, 2011; Salanova et al., 2014; Schaufeli, 2013).

Based on the predictions of both the occupational circumplex model of wellbeing (Bakker & Oerlemans, 2011) and the traditional circumplex model of emotions (Russell, 1980), it is expected that:

H4. The four job attitudes associated with well-being (engagement, satisfaction, burnout, and workaholism) are related to the four quadrants of the emotion circumplex:

(a) Workaholism is positively associated only with the highly-activated unpleasant descriptive affects and negatively with highly-activated and low-activated pleasant descriptive affects.

(b) Job satisfaction is positively associated only with low-activated pleasant descriptive affects and negatively with low-activated and high-activated unpleasant descriptive affects.

(c) Work engagement is positively associated only with high-activated pleasant descriptive affects and negatively with low-activated and high-activated unpleasant descriptive affects.

(d) Burnout is positively associated only with low-activated unpleasant descriptive affects and negatively with high-activated and low-activated pleasant descriptive affects.

Based on Tracey's (2000) recommendation and following the examples set by Russell (1980), we approached these hypotheses based on a diverse range of statistical techniques: correlation, factor analysis, and multidimensional scaling.

Method

Participants and procedure

The sample consisted of 178 participants (25% man and 75% women) working in a variety of occupational settings. The age of participants varies: 25.3% are aged between 18 and 27 years, 41% are between 28 and 37 years, 23% are between 38 and 47 years, 9.6% are between 48 and 57 years, and 1.1% for participants are older than 58 years. Data has been collected using paper-and-pencil face-to-face administration from employees aged 18 years and above. Ethical principles were ensured (e.g., informed consent), and no personal data has was retained after the end of the survey.

Measures

Affect. Affective states were assessed with PANAS-X (Watson & Clark, 1999) and the IWP Multi-Affect Indicator scale (Warr, 1990).

The PANAS-X includes 60 words describing emotions (items). Participants were asked to rate the extent to which they experienced each of the emotions on a 5-point Likert scale ranging from "*very slightly*" to "*very much*." Half of the emotions concern adverse affects (e.g., distressed, upset, guilty, ashamed, hostile, irritable, nervous, jittery, scared, afraid), while the other half consists of positive affect (e.g., interested, alert, attentive, excited, enthusiastic, inspired, proud, determined, strong, active). The internal consistencies of positive and negative emotions are .85, respectively .89, showing acceptable reliability.

The IWP Multi-Affect Indicator scale contains 16 items proposed by Warr (1990) to measure affective well-being at work. The participants' task was to indicate to what extent their job had made them experience any of those feelings over the past weeks on a Likert scale ranging from 1 (never) to 6 (always). A sample of affective descriptors from each quadrant: anxious, nervous, enthusiastic, excited, dejected, depressed, at ease, calm, and so on. The internal consistency

indices of the four quadrants (HANA, HAPA, LANA, LAPA) are .87, .87, .90, and .62 respectively. The first three quadrants show acceptable reliability with LAPA showing weak internal consistency. The IWP Multi-Affect Indicator has demonstrated good construct validity in the Romanian population (Butucescu, Zanfirescu, & Iliescu, 2017).

Job satisfaction. Job satisfaction was measured with the Job Satisfaction Survey (JSS, Spector, 1997). The JSS is a 36-item scale consisted of nine facets which assess employee attitudes about the job itself and various aspects of the job on a 6-point Likert scale ranging from "*total disagree*" to "*total agree*": pay ("*I feel I am being paid a fair amount for the work I do*"), promotion ("*There is really too little chance for promotion on my job*"), supervision ("*My supervisor is quite competent in doing his/her job*"), fringe benefits ("*I am not satisfied with the benefits I receive*"), contingent rewards ("*When I do a good job, I receive the recognition for it that I should receive*"), operating conditions ("*Many of our rules and procedures make doing a good job difficult*"), coworkers ("*I like the people I work with*"), nature of work ("*I sometimes feel my job is meaningless*"), communication ("*Communications seem good within this organization*"). Overall internal consistency is acceptable (α = .89).

Engagement at work. Work engagement was measured with the 9-item version of the Utrecht Work Engagement Scale (Schaufeli et al., 2006), also adapted in Romania (Vîrgă, Zaborilă, Sulea, & Maricuțoiu, 2009). Participants were asked to rate the frequency of feelings at work on a 7-point Likert scale ranging from 0 (never) to 7 (every day). Vigor, dedication, and absorption are the three core dimensions that define work engagement. A sample of items: "*At my work, I feel bursting with energy*," "*I find the work that I do full of meaning and purpose*," "*Time flies when I am working.*" Reliability analysis revealed an overall acceptable internal consistency coefficient (α = .93).

Burnout. Burnout was assessed with the Maslach Burnout Inventory-General Survey (MBI-GS; Schaufeli, Leiter, Maslach, & Jackson, 1996). The MBI-GS includes three core dimensions: Exhaustion (5 items; e.g., "*I feel emotionally drained from my work*"), Cynicism (5 items; e.g., "*I doubt the significance of my work*"), and Professional Efficacy (6 items; e.g., "*In my opinion, I'm doing poorly at my job*"). Respondents were asked to rate the frequency of affects on a 7-point Likert scale from 0 (never) to 7 (every day). Overall internal consistency is acceptable (α = .83).

Workaholism. Workaholism was measured with the Dutch Work Addiction Scale (DUWAS; Schaufeli, Van Wijhe, Peeters, & Taris, 2011). The DUWAS has a total of 17 items based on two core dimensions, working excessively (9 items; e.g., "*I seem to be in a hurry and racing against the clock*", "*I find myself continuing work after my co-workers have called it quits*") and working compulsively (7 items; e.g., "*I often wish I weren't so committed to my work*", "*It's important for me to work hard even when I don't enjoy what I'm doing*"). The DUWAS scale was adapted in Romania (Butucescu & Uscătescu, 2013). Respondents were asked to rate the frequency of their work behavior on a 4-point Likert scale from 1 (almost never) to 4 (almost always). The overall internal consistency is acceptable (α = .90).

Statistical approach

Principal component analysis (PCA) had been computed using R (R Core Team, 2016) to test our first hypothesis. PCA is used to determine the number of components in which the affective descriptors load. For our second hypothesis, confirmatory factor analysis (CFA) is used to determine whether our data support the 4-factor model; fit indices were computed using R and the lavaan package (Yves, 2012). The third hypothesis was approached with multidimensional scaling, using SPSS with the ALSCAL procedure (*IBM SPSS Statistics for Windows*, 2013). Multidimensional scaling is used to visualize the similarity between affective descriptors as well as the circular order of affects. For our last hypothesis, Pearson correlations have been used to determine whether job attitudes relate positively or negatively with highly or lowly activated pleasant-unpleasant affects.

Results

Exploratory factor analysis has been used to test our first hypothesis. Principal Component Analysis (PCA) was used to determine the number of components (Figure 3). Based on eigenvalues > 1, the analysis revealed 11 factors with 70.31% cumulative variance. As of our initial hypothesis in which we determined two dimensions, varimax rotation revealed the extraction of two factors with a cumulative variance of 43% (first factor 25% and the second, 18%) therefore supporting our first hypothesis. Factor loadings are displayed in Table 1.

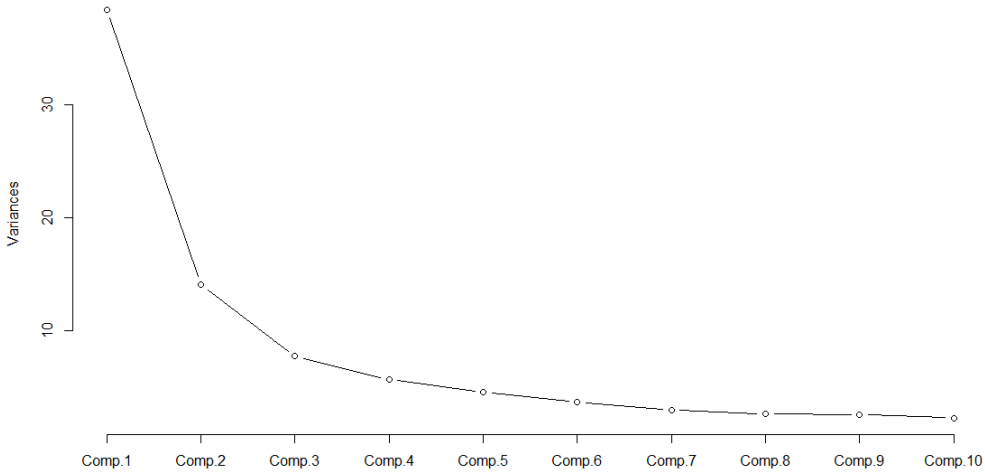

Figure 3. Principal Component Analysis of PANAS-X items.

Table 1. *Factor loadings for PANAS-X items*

	Factor	
	I	II
cheerful	-.39	.71
disgusted	.51	-.36
attentive	-.11	.57
bashful	.64	.02
sluggish	.47	-.14
daring	.06	.29
surprised	.37	-.03
strong	.06	.33
scornful	.55	-.21
relaxed	-.31	.61
irritable	.66	-.21
delighted	-.35	.76
inspired	-.21	.77
fearless	-.14	.72
disgusted with self	.52	-.33
sad	.71	-.23
calm	-.06	.59
afraid	.68	-.02
tired	.55	-.10
amazed	.41	.16
shaky	.69	-.16

	Factor	
	I	II
happy	-.34	.74
timid	.62	-.08
alone	.68	-.08
alert	.01	.53
upset	.76	-.21
angry	.66	-.19
bold	-.21	.64
blue	.74	-.30
shy	.78	-.02
active	-.09	.63
guilty	.60	-.23
joyful	-.26	.74
nervous	.57	-.06
lonely	.72	-.23
sleepy	.38	-.04
excited	.34	.44
hostile	.65	-.11
proud	-.04	.59
jittery	.66	-.10
lively	-.27	.85
ashamed	.54	.03

	Factor	
	I	II
at ease	.10	.30
scared	.70	-.08
drowsy	.60	-.31
angry at self	.58	-.19
enthusiastic	-.16	.76
downhearted	.76	-.26
sheepish	.78	-.08
distressed	.77	-.18
blameworthy	.60	-.25
determined	-.25	.64
frightened	.73	-.16
astonished	.40	-.02
interested	-.23	.83
loathing	.53	-.39
confident	-.37	.55
energetic	-.29	.62
concentrating	-.30	.57
dissatisfied with self	.41	-.14

Note. Factor loadings were computed using the principal component analysis method with varimax rotation.

CFA was performed with the lavaan package (Yves, 2012) in R. CFA helps us determine whether affective descriptors are grouped by pleasantness–unpleasantness and arousal–sleep dimensions which form four quadrants (HAPA, HANA, LAPA, and LANA). The method of estimation was maximum likelihood (ML). Results for the four-factor model showed lack of fit: χ^2/df = 6413.31, $p < .01$, CFI = .52, TLI = .50, RMSEA = .13 (90% CI = .12, .13), $p < .05$, SRMR = .12. The second hypothesis related to whether affects have a bi-factorial structure divided into highly and lowly activated positive and negative emotions as stated by Russell (1980). Our data did not support the second hypothesis in which we have tested the fitness of affective descriptors on the four quadrants.[1]

Results based on multidimensional scaling revealed our hypothesized circumplex structure (Figure 4), thus confirming the third hypothesis. Emotions fall in roughly a circular order, underlying two bipolar dimensions, pleasure-displeasure (horizontal axis) and the degree of arousal (vertical axis). Emotions are graphically represented as distances within a space. The more similar two or more emotions are, the closer they appear in space.

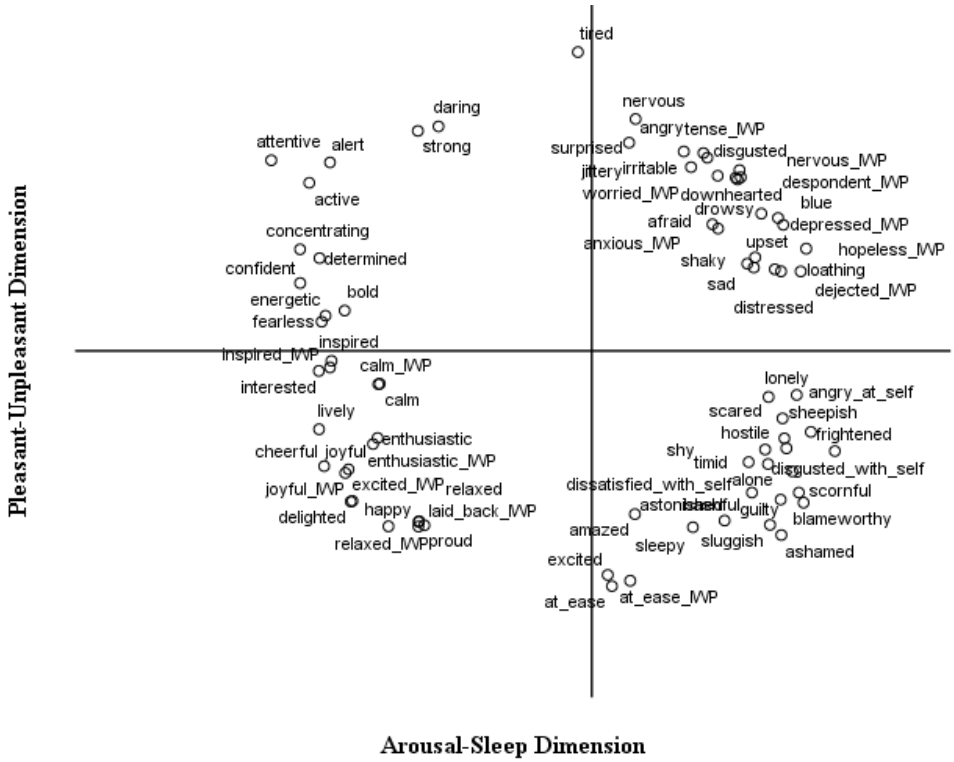

Figure 4. Circumplex model of emotions based on PANAS-X and IWP Multi-Affect Indicator items using Euclidean distance model computed with ALSCAL Multidimensional Scaling.

Note. Affective descriptors ending in _IWP are items from IWP Multi-Affect Indicator scale while the remainder is from PANAS-X.

[1] Due to the large image of the figure representing the 4-factor model, it could have not been inserted in this paper. The figure is available on request.

In relation to our fourth hypothesis regarding the relatedness of job attitudes with the four quadrants of the circumplex models (see Table 2), workaholism has been found to be positively associated only with one affective descriptor from HANA (worried, r = .21, p < .01) and negatively with none of the two quadrants, HAPA and LAPA.

Job satisfaction has been found to be positively related to three out of four LAPA affective descriptors (calm, r = .24, p <. 01; laid-back, r = .30, p < .01; relaxed, r = .36, p < .01) and negatively associated with HANA (anxious, r = -.24, p < .01; nervous, r = -.43, p < .01; tense, r = -.53, p < .01; worried, r = -.42, p < .01) and LANA (dejected, r = -.47, p < .01; depressed, r = -.48, p < .01; despondent, r = -.61, p < .01; hopeless, r = -.41, p < .01).

Work engagement is positively related to HAPA (enthusiastic, r = .68, p < .01; excited, r = .60, p < .01; inspired, r = .64, p < .01; joyful, r = .51, p < .01) and negatively related to HANA (anxious, r = -.16, p < .05; nervous, r = -.21, p < .01; tense, r = -.27, p < .01; worried, r = -.15, p < .05) and LANA (dejected, r = -.31, p < .01; depressed, r = -.34, p < .01; despondent, r = -.35, p < .01; hopeless, r = -.30, p < .01).

Burnout has been found to be positively associated with LANA (dejected, r = .32, p < .01; depressed, r = .48, p < .01; despondent, r = .49, p < .01; hopeless, r = .43, p < .01) and negatively associated with to HAPA (enthusiastic, r = -.48, p < .01; excited, r = -.44, p < .01; inspired, r = -.43, p < .01; joyful, r = -.41, p < .01) and three out of four affective descriptors of LAPA (calm, r = -.28, p <. 01; laid-back, r = -.23, p < .01; relaxed, r = -.48, p < .01).

Our data supported H4 (b, c and d) and partially H4 (a).

Table 2. *Table of correlations*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1 Job satisfaction																				
2 Burnout	-.50																			
3 Work engagement	.50	-.41																		
4 Workaholism	-.07	.27	.30																	
5 Anxious	-.24	.30	-.16	.07																
6 Nervous	-.43	.45	-.22	.12	.51															
7 Tense	-.53	.49	-.27	.13	.48	.84														
8 Worried	-.42	.38	-.15	.21	.55	.66	.70													
9 Enthusiastic	.38	-.48	.62	.06	-.06	-.22	-.26	-.14												
10 Excited	.48	-.44	.60	.10	-.23	-.41	-.44	-.44	.64											
11 Inspired	.35	-.43	.64	.11	-.18	-.14	-.17	-.12	.69	.67										
12 Joyful	.41	-.41	.51	-.08	-.12	-.44	-.45	-.34	.61	.72	.51									
13 Dejected	-.47	.32	-.31	.01	.56	.62	.61	.51	-.24	-.49	-.27	-.41								
14 Depressed	-.48	.48	-.34	.08	.47	.68	.72	.70	-.30	-.54	-.25	-.57	.62							
15 Despondent	-.61	.49	-.35	.05	.48	.75	.73	.64	-.33	-.54	-.33	-.45	.71	.73						
16 Hopeless	-.41	.43	-.30	.09	.44	.72	.68	.67	-.31	-.59	-.28	-.50	.65	.75	.75					
17 At ease	.04	-.09	.03	-.12	.05	.03	.02	.04	.21	-.01	.07	-.02	.09	.15	.07	.20				
18 Calm	.24	-.28	.27	-.10	-.12	-.17	-.18	-.20	.42	.38	.41	.48	-.04	-.27	-.09	-.18	.07			
19 Laid-back	.30	-.23	.39	.06	-.41	-.36	-.40	-.24	.35	.47	.33	.47	-.51	-.33	-.29	-.28	.04	.38		
20 Relaxed	.36	-.48	.46	-.04	-.30	-.37	-.37	-.27	.61	.53	.63	.50	-.27	-.33	-.36	-.27	.30	.50	.42	

Note. Correlations ≥ ±.10 are significant at p < .05; Correlations ≥ ±.20 are significant at p < .01.

Discussion

The present study examined whether emotions fall roughly in a circular model and to what degree does the affective descriptors relate to the four job-related attitudes (workaholism, engagement, burnout and job satisfaction) with the circumplex model of emotions (Russell, 1980). Our findings revealed that the pleasantness – unpleasantness and arousal – sleep dimensions account for the significant proportion of variance among measured affects with emotions relating to each other in a circular structure. More so, emotions are related to job-specific attitudes but lack a bifactorial structure consisting of two independent factors.

First, we explored the variance in affective descriptors accounted for by the two major dimensions (pleasant-unpleasant and arousal-sleep dimensions) emerging in factor analysis, our data revealed that these first two major factors account for 43% of the variance in affective descriptors. The next ten factors together fail to reach this level. We conclude that the two dimensions above account for most of the interpretable variance in emotions, as measured in our study. However, the test on whether the circumplex model approaches a bi-factorial structure with two independent factors (pleasant-unpleasant and arousal-sleep) failed, and our data did not support this hypothesis. While most of the variance loads indeed in these two most important factors, emotions show supplementary meaningful variance over and above that captured in the two factors and, subsequently, by the circumplex structure posited by them. Multidimensional scaling supports the circular order of affective descriptors as stated by Russell (1980). Finally, an active link between the quadrants of the affective circumplex and the job attitudes of engagement, job satisfaction, and burnout was determined, therefore reinforcing Bakker and Oerlemans' (2011) two-dimensional work-related subjective wellbeing model. Workaholism was connected with the affective circumplex to a lesser extent, with only one affective descriptor (i.e., worried) associated. More specifically, individuals with high and low levels of positive emotions related to a more positive attitude (i.e., work engagement, job satisfaction). As sustained by our results, negative affects emerge in negative attitudes (i.e., burnout). These results are better approached by the Broaden and Build Theory of Positive Emotions (Fredrickson, 2004) which states that positive affects broaden one's awareness and encourage novel and exploratory thoughts and action leading to feelings of happiness and joy generating positive work attitudes, also sustained by Ouweneel and colleagues' findings (2012).

Theoretical contributions

Similar to Russell's (1980) findings, affective descriptors are representative for pleasure-displeasure and arousal-sleep dimensions are therefore providing further evidence on the plausibility that diverse emotional states can be categorized. The bi-dimensional structure of affects remains unconcise regarding which emotions are representative of the four categories (i.e., pleasure, displeasure, arousal, and sleep). This might be due to the dependency of emotions individuals feel about the context. People chain significant emotions to various situations, (e.g., at work, one can be surprised and happy by its salary raise while others can feel surprised and downhearted when a less competent colleague gets a raise). In this example, surprise is a pleasant emotion while in the other case, the contrary. It is somewhat perilous to label an affective state with one of the four quadrants ignoring the particular situation in which emotions occur.

Are emotions unique and self-independent? Judging by our results, affects might be chained together. Related to the above example, surprised-happy and surprised-downhearted offer a possible framing in the pleasure-displeasure dimension rather than placing them independently.

Another interesting finding is tied to the weak relatedness of affective descriptors with workaholism. Although other studies provide evidence on the relation of emotions and negative work attitudes (Balducci, Cecchin, Fraccaroli, & Schaufeli, 2012; Clark et al., 2014), our findings partly found that workaholism is somewhat related to affective

descriptors. Our results raise further questions about the substantiation of workaholism.

Practical contributions

Based on our results, some suggestions (e.g., assessment, interventions, support groups) can be made for practitioners on assessing possible work-related attitudes based on their feelings. The current study provides further evidence of Bakker and Oerlemans' (2011) study on the conceptualization and measurement of well-being which states that work attitudes (i.e., engagement, burnout and job satisfaction) cover specific affects which organizational practitioners can map to understand emotional layers behind work behaviors. It can further advance in a screening procedure signaling emotions for unhealthy and unproductive work attitudes (e.g., burnout). Based on the proposed taxonomy of well-being, practitioners may be able to assess three prominent types of employee well-being (i.e., engagement, burnout and job satisfaction) and levels of affect (with the help of IWP Multi-Affect Indicator Scale, Warr, 1990), without the need of using a large number of questionnaires. In advance of the screening procedure, practitioners might propose intervention strategies to prevent burnout as well as to enhance job satisfaction and work engagement.

Limitations and further directions

We acknowledge some limitations of our study. First, the sample was strongly gender-skewed, with a predominance of female participants. As the discussion revolves around emotions, they are considered differentiated by gender (e.g., neuroticism, emotional instability), and gender effects should be further investigated. Second, the measurement of affective states has been made with self-reported scales such that the magnitude of correlations between items might have been influenced.

Another limitation was the use of a convenience sample. Future studies should focus on more occupational groups to further investigate the four quadrants of the circumplex model. Confirmatory factor analysis revealed lack of fit for the circumplex model. The main reason for the outcome is represented by the small number of participants as fit coefficients (i.e., RMSEA, CFI, TLI, SRMR) are highly dependable on the study's sample. Additionally, further studies should be conducted with longitudinal designs as affective states fluctuate over time depending on other factors (e.g., salary-raise, getting a department change, resignations). Moreover, longitudinal studies are recommended for further investigation of the causality link between affective states and job-specific attitudes which would help us even better to discriminate the relatedness of affective descriptors and work attitudes. Also, it would be worth investigating whether emotions are context-dependent.

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