Reinforcement Sensitivity Theory, Approach-Affect And Avoidance-Affect

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ABSTRACT

This paper brings together Reinforcement Sensitivity Theory and other perspectives on wellbeing to test predictions about dimensions of affect which are linked to approach motivation or avoidance motivation. Valence and activation are jointly conceptualized as either approach-affect or avoidance-affect through the diagonal axes of an affective circumplex. Across four studies in three different countries, predictions about Reinforcement Sensitivity Theory's Behavioural Activation System, Behavioural Inhibition System and Fight-Flight-Freeze System are found to be supported. Correlations with external variables are shown to depend on a wellbeing measure's emphasis on approach or avoidance, such that affect and external features which both emphasise motivation to approach or to avoid yield substantially larger intercorrelations than do non-concordant pairs. In addition, joining valence with activation is shown to yield correlational benefits as predicted. Implications of our perspective and operationalisation are reviewed, and specific research recommendations are made.

Research into emotion often emphasises the valence of a feeling state – its pleasantness or unpleasantness – and differences in valence are known to be linked with many other variables. For instance, affects with positive valence are more closely associated than negative affects with life satisfaction (Kuppens, Realo, & Diener, 2008), job performance (Warr & Nielsen, 2017), and subsequent health behaviours (Nylocks, Rafaeli, Bar-Kalifa, Flynn, & Coifman, 2019); and negative affects are more strongly linked with distress symptoms and trait neuroticism than are positively-valenced feelings (e.g., Thoresen, Kaplan, Barsky, Warren, & de Chermont, 2003; Watson, Wiese, Vaidya, & Tellegen, 1999).

In addition to differences in valence, feelings also vary importantly in terms of activation/arousal – their potential for action as readiness for energy expenditure (e.g., Remington, Fabrigar, & Visser, 2000; Russell, 1980, 2003; Yik, Russell, & Steiger, 2011).

For instance, in comparison with low-activation positive affects, those with higher activation are more strongly correlated with aspects of creativity (Baas, De Dreu, & Nijstad, 2008; De Dreu, Baas, & Nijstad, 2008) and with work performance (Warr, Bindl, Parker, & Inceoglu, 2014).

Valence and activation have usually been investigated as single variables on their own. However, several authors have pointed out that we need to look beyond each one singly, for example also to consider both aspects (e.g., De Dreu et al., 2008; Ferris, Yan, Lim, Chen, & Fatimah, 2016; Foo, Uy, & Murnieks, 2015; Kuppens, Tuerlinckx, Russell, & Barrett, 2013). The inclusion of potential action in addition to valence is thought likely to strengthen associations between affect and relevant aspects of the environment. However, we still need empirical evidence that their combination yields stronger associations with external variables than does valence or activation on their own.

Affective circumplex models

Particularly appropriate for studying that combination are circumplex frameworks of affect (e.g., Fromme & O'Brien, 1982; Posner, Russell, & Peterson, 2005; Remington et al., 2000; Russell, 1980, 2003; Watson & Tellegen, 1985; Yik et al. 2011), as illustrated in Figure 1. Location-appropriate feelings are illustrated around the outside of that figure, and the four quadrants are summarised as Anxiety (negative valence, high activation), Depression (negative valence, low activation), Enthusiasm (positive valence, high activation), and Comfort (positive valence, low activation).

The diagonal axes of such a circumplex bring together both valence and activation, and in Figure 2 are labelled as ranging from Depression to Enthusiasm and from Anxiety to Comfort. Previous research has found that those two axes are statistically primary. They have been interpreted as the 'major dimensions of emotional experience' (Watson & Tellegen, 1985, p. 234) which 'are grounded in differences in the nature of the core motives to which they pertain – approach and avoidance' (Carver, 2001, p. 353). Carver, 2003) describes them in these terms: 'The approach-related dimension ranges (in its "purest" form) from such affects as elation, eagerness, and excitement to sadness and dejection', whilst the avoidance-related dimension ranges '(in its "purest" form) from fear and anxiety to relief, serenity, and contentment' (p. 244).

The diagonal axis running from negative-valence low-activation feelings to positive-valence high-activation feelings thus embodies emotions which can be identified as 'approach-affect'. And the diagonal axis from negative-valence high-activation feelings to positive-valence low-activation feelings reflects 'avoidance-affect'. Both diagonal axes bring together valence and activation.

The two diagonal axes of the affective circumplex have received considerable attention as 'positive affect' and 'negative affect' in the PANAS scales of Watson, Clark, and Tellegen (1988). However, PANAS items describe only feelings of high activation rather than affects at all activation levels. This limitation was subsequently recognised by the scales' originators, who pointed out that 'to avoid terminological ambiguity, we have renamed the two factors Positive Activation and Negative Activation respectively, and use the abbreviations PA and NA in reference to these new labels only' (Tellegen, Watson, & Clark, 1999, p.298). However, many subsequent investigators have failed to apply this later thinking, and have viewed PANAS items as covering the entirety of affect. The use

of PANAS scales in the present research is also inappropriate because of the content of some items, which extend beyond valence and activation into additional feelings of shame, hostility and guilt. An affect scale representing only aspects of valence and activation will be applied in this paper.

Reinforcement Sensitivity Theory

Approach and avoidance motivation are central to Reinforcement Sensitivity Theory (e.g., Gray, 1971, 1987), but it appears that no previous researchers have linked that theory to axes of the affective circumplex and the primary statistical dimensions of affect. The theory has been examined from a range of perspectives – in neurological, pharmacological, animal, human experimental, social and personality research – and we extend previous investigations by applying it to affect in everyday settings.

Reinforcement Sensitivity Theory identifies two principal psycho-neurological systems – the Behavioural Activation System (BAS) and the Behavioural Inhibition System (BIS). BAS is proposed to regulate positive feelings and approach behaviours in respect of actual or potential reward, and BIS was originally suggested to manage negative feelings to avoid or escape from potential harm. As well as generating approaches to positive situations, the Behavioural Activation System also works to sustain currently-existing positive situations; and the Behavioural Inhibition System extends beyond the avoidance of new negative situations to include rectifying or escaping from those which are perceived as harmful (e.g., Bijttebier, Beck, Claes, & Vandereycken, 2009; Elliot, 2006).

Neurological and statistical evidence has consistently supported the distinction between BAS and BIS (e.g., Amodio, Shah, Sigelman, Brazy, & Harmon-Jones, 2004; Carver, 2001; Carver & Scheier, 1998; Carver & White, 1994), and the two systems have been found to operate through largely independent neural mechanisms associated with different patterns of brain activity. The frontal left region of the cortex has been shown to be primarily involved in the experience and expression of positive affect and approach-related motivation (the Behavioural Activation System), whereas the frontal right region is particularly active in negative affect and avoidance-related motivation (the Behavioural Inhibition System) (Berkman & Lieberman, 2010; Harmon-Jones & Allen, 1998; Tomarken & Keener, 1998). Using electro-encephalography to study cortical activity, Urry, Nitschke, Dolski, Jackson, Dalton et al. (2004) showed that the degree to which left frontal cortical activation is greater than right frontal activation is correlated around .30 with life satisfaction and other measures of wellbeing.

Within medical settings, low BAS and high BIS activity are linked to the occurrence and duration of clinical depression (Kasch, Rottenberg, Arnow, & Gotlib, 2002; Kircanski, Mazur, & Gotlib, 2013; Tomarken & Keener, 1998) and to other forms of psychopathology (Alloy, Abramson, Walshaw, Cogswell, Smith et al., 2006; Bijttebier et al., 2009). Furthermore, circadian rhythms have been shown to diverge between the systems, such that particularly clear variation across the day is found primarily for affects linked only to Behavioural Activation (Watson et al., 1999).

Aspects of the original Reinforcement Sensitivity Theory were subsequently modified by Gray and McNaughton (2000). Their revised version envisages three interdependent systems:

1. The Fight-Flight-Freeze System (FFFS). This component promotes avoidance of or escape from the sub-set of negative situations which are perceived to threaten personal harm. The FFFS has been summarised by Corr (2009, p.361) as the 'Get me out of here' system[1].

2. The Behavioural Activation System (BAS). As proposed in the original theory and its revision, the Behavioural Activation System mediates responses to all positive stimuli, encouraging approach or continued presence. BAS has been described as the 'Let's go for it' system (Corr, 2009, p.361).

3. The Behavioural Inhibition System (BIS) is most changed in the 2000 revision, now emphasising that negative stimuli are of two kinds. As well as external features which are clearly harmful and require escape (1, above), other aversive characteristics have aspects that additionally offer personal gain. After 2000, BIS is viewed as being concerned only with the sub-set of negative inputs that require uncertainty to be handled, perhaps because of affective ambivalence and experienced conflict between approach and avoidance. Many aspects of life are of this kind – unpleasant but acceptable for the benefits they bring. After revision of Reinforcement Sensitivity Theory in 2000, the Behavioural Inhibition System is considered to promote 'defensive approach' to situations involving goal conflict. It encourages movement towards or continuation in a situation but with uncertainty and personal caution (Gray & McNaughton, 2000); it has been summarised as the 'Watch out, be very careful' system (Corr, 2009, p.361; see also Corr, 2013; Smillie et al., 2006).

Hypotheses

Our overarching expectation is that research findings depend on which emphasis is primary in a study's measurement of affect – approach or avoidance. The pattern of differences is predicted to depend on the system of Reinforcement Sensitivity Theory that is currently active in response to situational conditions. Our studies' approach-affect and avoidance-affect are expected to be differently associated with exposure to environmental characteristics in the theory's three categories of stimuli – positive features (which activate BAS), negative-and-threatening features (through FFFS), and negative-but-non-threatening features (in terms of BIS). The theory's two most general categories are in that way 'approach' and 'avoid', and 'avoid' stimuli are separated into two sub-categories – those which directly threaten the self and those which are unpleasant but not personally threatening.

In relation to positive aspects of the environment, both the initial and revised versions of the Behavioural Activation System expect that positively-valenced features will encourage approach rather than avoidance, since positive features tend to be welcome and promote further contact. **Hypothesis 1** thus predicts that the level of a positive environmental feature will be more strongly associated with approach-affect than with avoidance-affect.

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[1] Other summaries of the revised model include those by Bijttebier et al. (2009), Corr (2004), Corr (2013), Corr and McNaughton (2012), Pickering and Corr (2008), and Smillie, Pickering, and Jackson (2006).

On the other hand, avoidance-affect is expected to be primary in relation to the subset of negative aspects of the environment which threaten personal harm. For the subcategory of negative features which are personally threatening, correlations with avoidance-affect are expected to be more substantial than correlations with approach-affect as people are motivated to escape from danger. For instance, an uncontrollable situation or unmanageable demands threaten the individual for their potential to overwhelm other goal-directed activity. Thus **Hypothesis 2** predicts that correlations will be more substantial with avoidance-affect than with approach-affect for those negative features which threaten harm to an individual or group.

However, for negative features which do not threaten personal harm the revised Behavioural Inhibition System makes a different prediction. As described above, the updated theory proposes that those conditions tend to encourage reluctant acceptance and cautious approach, so that **Hypothesis 3** predicts that environmental conditions which are negative but do not present a personal threat will instead yield stronger correlations with approach-affect rather than with avoidance-affect. For example, being employed in a boring job can be unpleasant but may be accepted because it also offers financial and social benefits. Reinforcement Sensitivity Theory thus distinguishes between two kinds of aversive stimuli, despite them both being affectively negative.

As noted earlier, several authors have suggested that additional explanatory power would derive from bringing together the two primary axes of affect, such that in this project correlations between a relevant external feature and the conceptually-linked diagonal axis in Figure 2 would be greater than with each component alone. **Hypothesis 4** investigates this untested possibility. In those terms, we predict that approach-affect or avoidance-affect, whichever is concordant with a studied feature, will be more strongly associated with that feature than will a single component alone – either valence or activation.

Research method

Settings and participants

Much research into reported affect has studied university students, but for wider ecological validity it is essential also to investigate people in their real-life environments (e.g., Kuppens, 2019). As illustrated by Ashkanasy and Humphrey (2011) and Judge, Weiss, Kammeyer-Mueller, and Hulin (2017), settings of paid work are central to emotional experiences in almost every adult's life, and we examined the paper's hypotheses in relation to job-related feelings. In order to study a wider range of variables and to examine replicability across situations, we conducted four overlapping investigations. Approach-affect and avoidance-affect were measured in the same way throughout, and job features were varied across the studies.

Across our studies, we have followed recommendations about sample size, with a minimum number of observations five times greater than the number of variables to study (e.g., Cohen, 2013). We also considered the types of statistical analyses to be performed based on our sample sizes (e.g., Bonett & Wright, 2000; Mundfrom, Shaw, & Ke, 2005). Samples across our studies adhered to these minimum recommendations and (in the case of Studies 1 and 2), comfortably exceeded them. In Study 3 (N=203), data collection was stopped slightly earlier than planned, associated with an unexpected natural disaster. In

Study 4, responses were collected from 466 individuals, but for this paper we focussed on the 190 respondents who were employed. Sample sizes in these two, smaller, studies were still above the minimum requirement.

Study 1 investigated organisational and personal factors associated with successful aging among workers in United Kingdom healthcare and information and communication technology (ICT) organizations (Taneva & Arnold, 2018). Invitations to participate were sent to employees in four large organizations, two each in the ICT and healthcare sectors. These were distributed through an organization's intranet and by email from Human Resource departments, and specified that the target group was aged 55 years and above. It was indicated that participation was voluntary and confidential, and that general feedback about the findings would be available on request. Between October 2014 and May 2015, complete responses were received from 853 individuals. Participants' mean age was 57.8, and 346 (41%) were female. Five hundred and twelve (60%) of the respondents were in non-management jobs, and only 31 (4%) were in upper-management roles.

Study 2 was undertaken in the United Kingdom in the period between November and December 2017. Potential participants (employed for at least ten hours a week) were contacted through an internet survey panel and offered £3 for each survey completed, in line with recommendations of the panel provider and the university's ethical procedures. In order to reduce possible common-method variance, affect information was collected after a temporal lag: participants first provided information about themselves and their job, and a week later they reported their job-related wellbeing. Four hundred and two workers (50% of those originally invited) fully completed both questionnaires. Respondents were drawn from a range of jobs, primarily in education and health services, wholesale and retail distribution, professional services, government, and manufacturing industry. Their mean age was 45.6 years with a range from 20 to 65, and 56.2% were female.

Study 3 took place in Puerto Rico in mid-2017 to examine predictors of job boredom. Human Resource managers or general supervisors of 16 organizations in the service, health, education and non-profit sectors were invited to forward to colleagues a confidential online voluntary questionnaire, aiming to learn more about associations with work-related demands and resources. The voluntary nature of participation was stressed, and contact details for the independent research team were provided; all participants electronically read and agreed to accept the potential risks and benefits. Complete responses were received from 203 people, with a mean age of 33.8 ranging from 19 to 70 years. Most respondents (76.8%) worked for privately-owned sales, service or health organizations, around two-thirds (67.7%) were female, and a high proportion (85.1%) held university degrees.

Study 4 investigated factors associated with young Spanish workers' feelings about their job in the period between June and October 2015, focusing on the role of job insecurity. Responses were collected by a human resources consulting group, which was hired for this purpose. Members of 20 production, retail and service organizations responded to questionnaires online, but a pencil-and-paper version was also offered; subsequent analyses confirmed that no significant differences occurred between responses from the two sets of respondents. Completed questionnaires were obtained from 190 workers aged under 30 with at least two years' work-experience. Respondents' mean age was 26.1 years, 64.1% held a university degree, and 54% were women. After completing

the questionnaire, participants received details of their own psychosocial factors at work – automatically for online respondents and upon request for others.

Analytical approach

As with any cross-sectional investigation, causal impact is not under investigation; our concern is to test predictions about observed associations between different affects and perceived external features; what is factually the case? Bringing together four separate data-sets for the same analyses has substantial advantages over reliance on a single empirical investigation. A broader range of variables can be included than is practicable with a single set of participants, cross-validation of findings can be checked, generalizability between samples can be assessed, and associations with alternative measures of the same construct can be compared.

The Multi-Affect Indicator

For testing the paper's hypotheses, we required an instrument to assess both valence and activation which permits diagonal assessment of feelings about particular settings of life. Each study therefore made use of the Multi-Affect Indicator (MAI), which is shown in the Appendix. Developed from measures by Warr (1990) and Van Katwyk, Fox, Spector, and Kelloway (2000), this applies Figure 1 by asking about 16 affects experienced in a particular setting or domain of life across a specified time-period. Instructions can be adjusted to change respondents' focus in terms of target; for instance, respondents might be asked about feelings in their family life, their job, or their social activities. The focal time period can also be varied; the present focus was on a respondent's job in the past week.

Items in the Multi-Affect Indicator were selected to directly represent the valence-and-activation perspective, excluding multi-theme feelings such as guilt and shame which are included in PANAS. Previous research has demonstrated that MAI scale content well reflects the underlying model (e.g., Butucescu, Zanfirescu, & Iliescu, 2017; Madrid & Patterson, 2014; Warr et al., 2014), and CIRCUM outcomes (Browne, 1992) from items in the present four data-sets are provided as online supplemental analyses. For example, items in each quadrant of the Indicator were found to be closely grouped together in CIRCUM analyses, and relative to low-activation feelings the items considered to be high-activation were found in all studies to have greater activation scores.

The questionnaire (see Appendix) can be used at all levels of education, and is usually completed in three or four minutes. Affects in the negative quadrants of Anxiety and Depression were here reverse-scored, so that positive scores always represented positive feelings, and mean scores were computed for each quadrant by averaging its four single affects. For the diagonal axes of approach-affect and avoidance-affect, mean scores in a quadrant were combined with means from the diagonally-opposite quadrant, after score-reversal of negative feelings.

The Multi-Affect Indicator was developed in the English language, and translation was needed for use outside the United Kingdom. The present Studies 3 and 4 used the same Spanish-language version. Translation and back-translation were undertaken

independently by two bilingual researchers with expertise in psychometrics and psychology. One translator made the initial conversion from English, and the second person translated back from the Spanish version; the original and back-translated versions were found to be identical.

As part of Study 2, respondents additionally described themselves through established personality measures – completing scales of Approach Temperament and Avoidance Temperament (Elliott and Thrash, 2010) and Carver and White's (1994) trait scales of the Behavioural Activation System and the Behavioural Inhibition System. Continuing traits operate as habitual routines and occur within episodic thoughts and feelings, so that each short-term axis of affect was expected to be primarily associated with its corresponding trait form – approach-affect with approach-personality, and avoidance-affect with avoidance-personality[2]. That differentiated pattern was found to be present. In respect of Elliott and Thrash's (2010) scales, approach-affect was found to be correlated .29 with the trait scale of Approach Temperament in Study 2 but only -.02 with Avoidance Temperament. And corresponding correlations with the Behavioural Activation System and the Behavioural Inhibition System (Carver & White, 1994) were .24 versus .02. In contrast, avoidance-affect was much more closely associated with the two avoidance traits: -.09 and -.42 with Approach and Avoidance Temperament and -.04 and -.39 with BAS and BIS. These patterns provide additional support for the construct validity of our new affect scales.

Environmental features

The paper's hypotheses were tested in respect of 16 measures of perceived job characteristics, the levels of which are known from much previous research to be important proximal predictors of occupational well-being (e.g., Warr & Clapperton, 2009; Zacher & Schmitt, 2016). Studied characteristics are presented below in the three categories of Reinforcement Sensitivity Theory – positive job aspects, negative-and-personally-threatening features, and negative-but-not-threatening features.

Positive job aspects

Many research studies have shown that the following positive aspects of a job are important for incumbents' wellbeing.

Social support. This job feature was measured in all our investigations. In Study 1 four items from the Work Design Questionnaire (Morgeson & Humphrey, 2006) were included, for example, 'People I work with take a personal interest in me'. Five response options ranged from strongly disagree to strongly agree ($\alpha = .81$). Study 2 employed four items from the support measure of Baard, Deci and Ryan (2004), for example 'My managers convey confidence in my ability to do well at my job', with five response options from strongly disagree to strongly agree ($\alpha = .92$). Study 3 measured social support through the three items in the work-based index of relatedness presented by Longo et al. (2016). This has seven response options from strongly disagree to strongly agree, and an illustrative item is 'In my job I feel the people I interact with really care about me' ($\alpha = .92$). Study 4 used six items from Van den Broeck, Vansteenkiste, De Witte, Soenens, and

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[2] Note that this trait-state overlap is expected to be reduced in the present research, since personality traits were measured in context-free terms and the axes of affect were studied with a job-related focus.

Lens (2010), also with seven response options between strongly disagree and strongly agree, for example 'At work, I feel part of a group' ($\alpha = .74$).

Task autonomy. Autonomy at work was examined in three of our studies. Study 1 used three items based on the Job Autonomy scale of Hackman and Oldham's (1975) Job Diagnostic Survey, for example 'My job permits me to decide on my own how to go about doing the work'. The established five-option response scale ranged from strongly disagree to strongly agree ($\alpha = .80$). Study 3 applied the three-item measure of autonomy developed by Longo, Gunz, Curtis, and Farsides (2016). Items included 'In my job I feel I'm given a lot of freedom in deciding how to do things', with seven response options from strongly disagree to strongly agree ($\alpha = .92$). Study 4 included six items from the scale of job-related autonomy self-determination described by Van den Broeck et al. (2010). An illustrative item is 'I feel free to do my job the way I think it could best be done', with seven response options between strongly disagree and strongly agree ($\alpha = .73$).

Task meaningfulness. Experienced meaning in one's job was measured in Study 3 by four items based on the questionnaire by Arnold, Turner, Barling, Kelloway, and McKee (2007). With a seven-point response scale from strongly disagree to strongly agree, the four items used here included 'I am able to achieve important outcomes from the work I do in this job' ($\alpha = .84$).

Task significance. From the Work Design Questionnaire developed by Morgeson and Humphrey (2006), Studies 1 and 3 used the four-item scale of a job's rated significance, including 'The job itself is very significant and important in the broader scheme of things'. Five response options ranged from strongly disagree to strongly agree (Study 1 $\alpha = .88$; Study 3 $\alpha = .84$).

Negative-and-personally-threatening features

Four negative aspects of the work environment were investigated as presenting threats likely to yield personal harm: financial pressure, job insecurity, time pressure and unmanageable demands.

Financial pressure. Perceived threats from a lack of money were examined in Study 4 with three items devised for this project, such as 'I urgently need a source of income to meet my living costs'. Seven response options were provided from strongly disagree to strongly agree ($\alpha = .83$).

Job insecurity. Individuals' perceived probability of losing their job was recorded in Study 4 by four items from the Spanish validation of the Job Insecurity Scale introduced by Van der Elst, De Witte, & De Cuyper (2014). An illustrative item is 'I think I may lose my job in the near future', and the seven response options ranged from strongly disagree to strongly agree ($\alpha = .81$).

Time pressure. Threats from a lack of time were examined in Study 2 through the measure presented by Wu, Parker and De Jong (2014). The three items included 'There is a lot of time pressure in my job', and five response options ranged from strongly disagree to strongly agree ($\alpha = .84$).

Unmanageable demand. The 14-item Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) was also applied in Study 4. This covers responses to a wide range of stressful life situations (with no items about paid work), asking how frequently each one has occurred in the last month between never to very often. Five items from this scale were selected as covering situations which respondents felt unable to manage, such as 'In the past month, how often have you found that you could not cope with all the things you had to do?' and 'In the past month, how often have you felt unable to control the important things in your life'. These items were averaged into an overall index of unmanageable stressors ($\alpha = .76$).

Negative-but-not-threatening features

Boring activities. Study 3 recorded appraisals of boring task requirements through the nine-item scale presented by Martínez-Lugo and Rodríguez-Montalbán (2016). Items included 'I feel that time passes slowly in my work', and the seven-point response scale ranged from strongly-disagree to strongly-agree ($\alpha = .96$).

Unused qualifications. Self-assessments that one's job needs less expertise or education than actually possessed were obtained in Study 3 through the nine-item scale presented by Maynard, Joseph, and Maynard (2006). An example is 'My job requires less education than I have', with seven available responses from strongly disagree to strongly agree ($\alpha = .91$).

Control variables

Two demographic variables have also been shown to be important in this research area – age and sex. For instance, a longitudinal study by Carstensen, Turan, Scheibe, Ram, Ersner-Hershfield, Samanez-Larkin, Brooks, and Nesselroade (2011) found that emotional wellbeing improves from early adulthood to old age; and a meta-analysis of 183 studies showed that women are more likely to be emotionally exhausted than men, especially in the United States (Purvanova & Muros, 2010).

Findings from the four studies

Table 1 presents descriptive statistics which confirm that alpha coefficients for our affect measures are high, and that different quadrants of affect are intercorrelated. Also presented is summary information about the paper's diagonal axes – approach-affect from feelings of Depression to Enthusiasm, and avoidance-affect between Anxiety and Comfort.

Findings to test our hypotheses are shown in Tables 2, 3 and 4. Individual correlations in those tables partly reflect overlap with other emotions in the circumplex, and we followed standard analytic procedure (e.g., Berkman & Lieberman, 2010; Harris, Daniels, & Briner, 2003) by controlling for other quadrants, so that cited controlled correlations are over and above the contribution from other affects. Demographic controls for age and sex were also applied, and the tables additionally show values without all controls. Two-tailed statistical significance of differences between dependent correlations with approach-affect and avoidance-affect are reported, and mean controlled values are summarised across studies in the right-hand columns.

Tables 2, 3 and 4 also report correlations between each studied feature and valence-scores and activation-scores alone. In comparing those correlations with others in a table, it is essential that the same statistical controls have been applied in every case. In order to ensure analytic consistency, controlled findings are reported separately for affects which are higher and lower on the other axis, and average correlations with each feature are provided.

Within our general expectation that environmental features give rise primarily to approach-affect or avoidance-affect as a function of their nature, our first three hypotheses draw from Reinforcement Sensitivity Theory to predict contrasting salience for approach-affect versus avoidance-affect in relation to different types of environmental feature. For the category of positive features, **Hypothesis 1** expects more substantial correlations with approach-affect than with avoidance-affect, and a large difference of that kind was found. Average controlled correlations of positive features with approach-affect and avoidance-affect are shown to the right of Table 2 to be very different: .39 versus -.01. For example, this table shows that, in different samples and with different measures, job-related autonomy, meaningfulness, social support and task significance were always much more strongly correlated with approach-affect than with avoidance-affect.

Our second and third hypotheses also predict differences between correlations with approach-affect and avoidance-affect, contrasting negative features which either pose or do not pose a threat to personal wellbeing. As previously indicated, those two types of negative experience are thought to invoke different systems of the revised Reinforcement Sensitivity Theory – the Fight-Flight-Freeze System (FFFS) and the Behavioural Inhibition System (BIS) respectively. Hypothesis 2 predicts that the subset of threatening negative features will yield correlations through FFFS with avoidance-affect which are more substantial than those with approach-affect, but for negative features without a personal threat correlations with approach-affect are expected by Hypothesis 3 to be more substantial.

Table 3 presents findings about **Hypothesis 2**, in respect of four external features which may create threats to the person – financial pressure, job insecurity, time pressure and unmanageable demands. Those features generally imply future harm and dangers to the self. For instance, lack of money and uncertainty about retaining one's job are particularly distressing for workers who need to continue receiving wages to support a family. The right-hand column reports average controlled correlations of -.18 with avoidance-affect and -.06 with approach-affect.

In retrospect however, many of the young workers investigated in our Study 4 may have viewed financial pressure and job insecurity as less than immediately threatening to their person. Although both younger and older individuals are expected to see those features as unpleasant, our young participants in Study 4 may not have appraised them as personally threatening in the ways predicted for older people needing to support a family. In addition, social familiarity may have been high. At the time of Study 4, a very high proportion of young Spanish individuals were out of work (the national youth unemployment rate was for some periods as high as 54%), forty-three per cent of our sample received state benefits, and only 4% lived alone; the large majority thus had access to family or group support. In those circumstances, financial difficulties and job insecurity were probably viewed as unpleasant aspects of the environment rather than constituting personal threats to the self.

Average findings in Table 3 support this post hoc suggestion. For financial pressure and job insecurity (retrospectively considered unpleasant but not personally threatening in our young sample), the mean correlations with approach-affect and avoidance-affect were found to be very similar (-.06 and -.07 respectively). In contrast, the other features in Table 3 (which threaten personal harm at any age) the difference between correlations strongly supported the prediction – averaging -.29 for avoidance-affect versus -.07 for the approach axis.

In contrast, the updated Behavioural Inhibition System suggests (**Hypothesis 3)** that negative features which are not personally threatening will be more strongly associated with approach-affect than with avoidance-affect. Table 4 shows that this was the case: non-threatening negative features were more strongly associated with approach-affect than with avoidance-affect. For instance, higher levels of boring activity were found to be strongly associated (-.74) with reduced approach-affect, in contrast with only .28 for avoidance-affect. Average controlled correlations with the sub-set of negative but non-threatening aspects of the environment were -.58 with approach-affect versus .28 with avoidance-affect.

Hypothesis 4 extends across the three systems of Reinforcement Sensitivity Theory. As indicated above, several authors have argued that combining valence with activation is likely to strengthen correlations with external features. Within that overall expectation, Hypothesis 4 expects that correlations with approach- or avoidance-affect (whichever is concordant with the studied feature) will be larger than correlations with valence or activation alone. In those terms, controlled correlations with avoidance-affect should exceed correlations with valence or activation alone for negative threatening aspects of the environment in Table 3, whereas approach-affect should yield more substantial correlation benefits for the positive variables in Table 2 and the non-threatening negative variables in Table 4.

For positive job features, the right-hand side of Table 2 shows that average controlled correlations with approach-affect were .39 against only .10 for valence and .20 for activation on their own. For negative and threatening features (reported in Table 3), mean controlled r's for avoidance-affect were -.18 versus only -.09 and -.13 for valence and activation. And for negative features which do not pose a threat to the person average values in Table 4 were -.58 in respect of approach-affect compared to -.13 and -.21 for valence and activation alone.

Across all studied features, the average unsigned correlation was .36 for a predicted concordant affect, but only .16 for valence and .13 for activation alone. . Average correlations with concordant approach-affect or avoidance-affect were thus approaching three times greater than those with a single element of those scores. Hypothesis 4 was in that way supported; concordant affects which combine valence and activation were much more closely associated with situational features than were valence or activation on their own.

Discussion

In overall terms, this project is notable for combining Reinforcement Sensitivity Theory with other established perspectives on wellbeing. Applying an affective circumplex, we

have measured approach-affect and avoidance-affect as diagonal combinations of valence and activation, confirming predictions about contrasting patterns of correlation with approach-affect and avoidance-affect in respect of the three systems of Reinforcement Sensitivity Theory. Findings were consistent across samples and countries, and the paper has extended empirical coverage of that theory to embrace real-life settings of paid work.

Additional contributions extend previous research in several ways. First, we have applied Reinforcement Sensitivity Theory to illustrate in field settings the contrast between two negative categories which need to be distinguished – those which may be experienced as personally threatening and those which are aversive but have aspects which are acceptable. Updated Reinforcement Sensitivity Theory (Gray & McNaughton, 2000) proposes that negative inputs in the first sub-category (those which are personally threatening) operate through the Fight-Flight-Freeze system in terms of avoidance-affect (Hypothesis 2), whereas non-threatening negative features draw on the Behavioural Inhibition System to emphasize approach-affect (Hypothesis 3). Our results confirm the existence of this contrasting pattern: negative features that personally threaten an individual were found to be more strongly associated with avoidance-affect, but other negative features which are not personally threatening were more closely linked with approach-affect.

Second, consistent with suggestions by Ferris et al. (2016), Foo et al. (2015) and Kuppens et al. (2013), our findings illustrate and support practical measures to show that supplementing valence with activation yields stronger associations with environmental features than does valence alone. In respect of this difference, it is arguable that the inclusion of single elements together with their combination entails a stronger correlation with a diagonal axis in comparison with valence or activation alone. Nevertheless, as a matter of observed fact the diagonal-axis combination of valence and activation has been shown to be more predictive than either of those on their own. Whatever the source of that difference, it clearly deserves additional research attention; investigators need more often to focus on the diagonal axes.

Third, our approach is supported by independent and unrelated studies which have identified the diagonal axes as indicators of approach-motivation and avoidance-motivation. Depression-to-Enthusiasm and Anxiety-to-Comfort are of widespread application in those two respects. Fourth, our circumplex-based operationalisation of approach-affect and avoidance-affect through the Multi-Affect Indicator has been supported by four organisational studies in three different countries.

By conducting the same analyses across four different samples, we have been able to study a particularly broad range of variables. Research settings and participant characteristics differed between studies, yet theory-derived patterns were consistently replicated, sometimes through different operationalisations of the same construct. In focussing on emotions in a job, the project has extended research into Reinforcement Sensitivity Theory beyond previous investigations, which have almost always examined university students or animals in laboratory conditions.

Threatening and other negative features

Updated Reinforcement Sensitivity Theory (Gray & McNaughton, 2000) proposes that negative inputs which are personally threatening operate through the Fight-Flight-Freeze

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system in terms of avoidance-affect (Hypothesis 2), whereas non-threatening negative features draw on the Behavioural Inhibition System to emphasize approach-affect (Hypothesis 3). Our results confirm the existence of that contrasting pattern: negative features that threaten an individual were found to be more strongly associated with avoidance-affect, but different negative features that are not personally threatening were more closely linked with approach-affect.

Limitations and directions for future research

It is now necessary to test the paper's predictions and apply our measures of approach-affect and avoid-affect in other settings and with other positive and negative aspects of the environment. As part of this extension, Reinforcement Sensitivity Theory has a general need to better conceptualise its two categories of negative stimulus – features which are personally threatening and those which are less threatening to the person. We have measured external features through self-report scales known (and shown here) to be internally reliable, but additional investigations might supplement the present findings with feature-ratings obtained from knowledgeable observers or research participants themselves.

Comparisons between job-feature ratings by job-holders and by other observers have shown that the similarity between self- and other-associations is greater when external features can more easily be observed (e.g., Spector, 1992; Spector, Rosen, Richardson, Williams, & Johnson, 2019). In their Affective Events Theory, Weiss and Cropanzano (1996) point out that "environmental features influence affect primarily by making affective events (or the recall or imagination of affective events) more or less likely" (p. 11).

In addition to studying average patterns, we should also ask about possible moderating influences, such as personal characteristics and additional situational demands. Different sets of researchers in this area have developed their own conceptual structures, and there is a great need for increased cross-fertilisation between perspectives. For example, stress investigators often draw from Lazarus and Folkman's (1984) theory in terms of their three categories of stress appraisal – threat, harm/loss, or challenge. Processes in the first of these categories parallel FFFS in the revised Reinforcement Sensitivity Theory, and the others can be viewed in terms of BIS[3]. However, there is otherwise very little conceptual or empirical overlap between the different perspectives.

Similarly, organisational psychologists have developed notions of 'hindrance' and 'challenge' stress (e.g., Cavanaugh, Boswell, Roehling, & Boudreau, 2000), such that challenge stressors are defined as negative but with associated personal gains (as in the updated BIS). That dichotomy has been expanded by Tuckey, Searle, Boyd, Winefield and Winefield (2015) to also include stressors that threaten the self, creating a tripartite framework extremely similar to Reinforcement Sensitivity Theory. It is now important to explore other forms of potential integration between seemingly unconnected models devised by separate sets of investigators.

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[3] BAS is also present in Lazarus and Folkman's (1984) framework, within their category of 'benign-positive' appraisals.

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It is also desirable to examine links between episodic approach-affect and avoidance-affect (studied here) and trait measures associated with the most recent versions of personality based on Reinforcement Sensitivity Theory (e.g., Corr & Cooper, 2016; Jackson & Smillie, 2004). More generally, the paper's approach-avoidance perspective should be retained in future models and in new empirical research.

Spector (2019) and others have pointed out that cross-sectional research designs are particularly appropriate for identifying patterns of relationship, prior to possible research into causal influences. Like many other researchers, we have implicitly assumed that environmental features give rise to emotional reactions, but partial or complete causality has yet to be demonstrated. Some follow-up research should build on this paper's cross-sectional findings to study approach-affect or avoidance-affect as possible mediators or moderators. For instance, threatening negative features (e.g., overwhelming time pressure) might influence behaviour by more strongly promoting avoidance-affect, whereas other aversive features (for example, a boring task) might have a primary impact through approach-motivation. The diagonal valence-and-activation axes now deserve more intensive study as possible intervening variables as well as in their own right.

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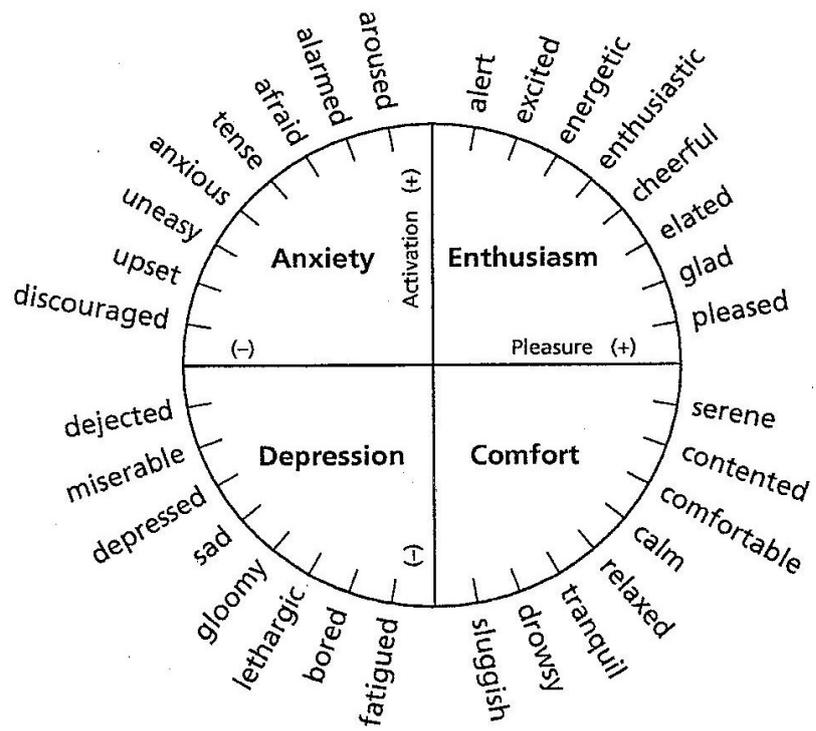
Figure 1. Affective wellbeing in terms of positive or negative valence and high or low activation. The quadrant labels Anxiety and Depression refer here to kinds of feeling and not to medical diagnoses
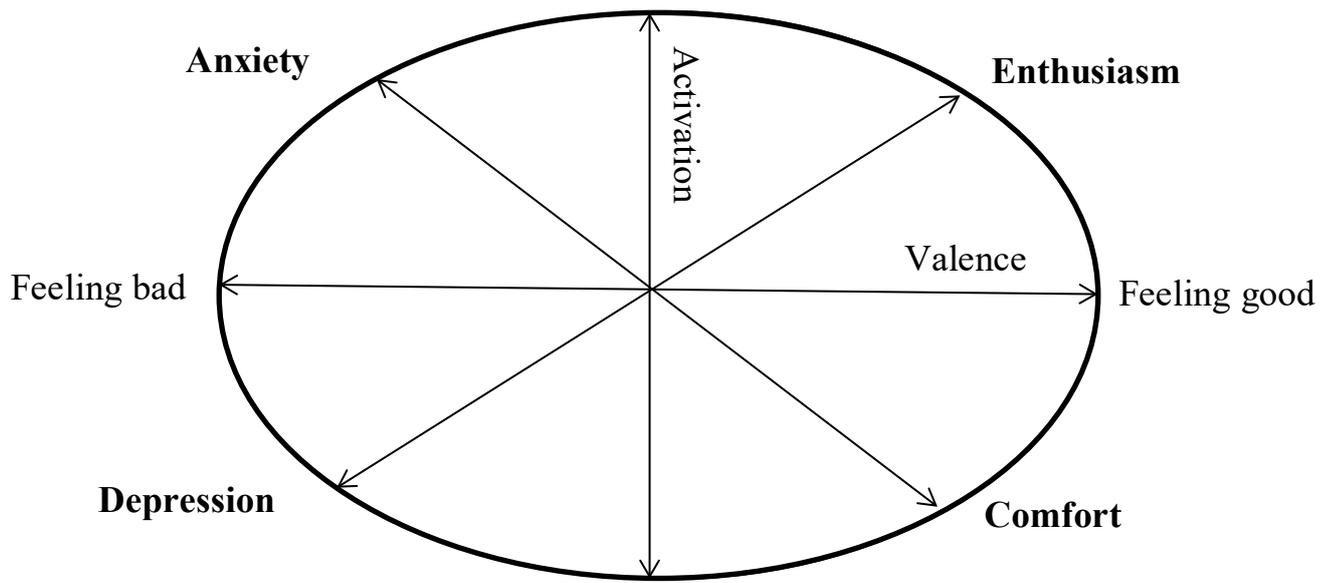
Figure 2. Approach-affect and avoidance-affect, diagonally between the quadrants here labelled as Depression and Enthusiasm and between Anxiety and Comfort

Table 1. Affect means, standard deviations and intercorrelations in the paper's four studies

Affect quadrant or axis		Mean (Standard deviation in brackets)	Alpha coefficient	Depression quadrant (D)	Enthusiasm quadrant (E)	Anxiety quadrant (A)	Comfort quadrant (C)	Avoidance-affect (A-C)
Depression quadrant (D)	Study 1	5.78 (1.41)	.90					
	Study 2	3.50 (0.84)	.90					
	Study 3	5.70 (1.39)	.91					
	Study 4	5.84 (1.35)	.87					
Enthusiasm quadrant (E)	Study 1	3.44 (1.37)	.88	.40				
	Study 2	2.50 (1.07)	.91	.26				
	Study 3	4.21 (1.57)	.92	.62				
	Study 4	4.18 (1.37)	.81	.37				
Anxiety quadrant (A)	Study 1	5.36 (1.36)	.90	.77	.30			
	Study 2	3.24 (0.96)	.92	.75	.20			
	Study 3	5.16 (1.35)	.86	.53	.26			
	Study 4	4.78 (1.40)	.82	.61	.09			
Comfort quadrant (C)	Study 1	3.88 (1.44)	.88	.47	.62	.57		
	Study 2	2.98 (1.03)	.88	.40	.63	.51		
	Study 3	3.89 (1.43)	.79	.50	.63	.53		
	Study 4	3.90 (1.31)	.77	.34	.58	.34		
Avoidance-affect (A-C axis)	Study 1	4.62 (1.24)	.90	.70	.52	.88	.89	
	Study 2	3.61 (0.87)	.90	.65	.48	.86	.88	
	Study 3	4.52 (1.21)	.86	.59	.51	.87	.88	
	Study 4	4.32 (1.13)	.76	.57	.40	.83	.81	
Approach-affect (D-E axis)	Study 1	4.61 (1.16)	.97	.84	.83	.64	.65	.73
	Study 2	3.50 (0.76)	.85	.73	.85	.55	.66	.70
	Study 3	4.95 (1.33)	.92	.88	.91	.42	.63	.61
	Study 4	5.01 (1.12)	.73	.83	.83	.42	.55	.59

Notes. Study 1 N = 853, Study 2 N = 402, Study 3 N = 203, Study 4 N = 190. Negative affects have been reverse-scored. Studies 1, 3 and 4 recorded affect in on the 1-to-7 scale shown in the Appendix; Study 2 used a 1-to-5 scale ranging from Not at all to Extremely.

Table 2. Positive environmental features: Controlled correlations with approach-affect, avoidance-affect, valence and activation scores and their corresponding confidence intervals at 95%, in brackets, are presented in bold font. Uncontrolled correlations and their confidence intervals at 95%, in brackets, are shown below the controlled correlations and their confidence intervals.

Form of job affect	Autonomy (Study 1)	Autonomy (Study 3)	Autonomy (Study 4)	Meaning-fulness (Study 3)	Social support (Study 1)	Social support (Study 2)	Social support (Study 3)	Social support (Study 4)	Task significance (Study 1)	Task significance (Study 3)	Mean controlled correlation
Approach-affect Depression (D) to Enthusiasm (E)	**.37** **[.32, .44]** .48 [.42, .54]	**.32** **[.19, .44]** .48 [.35, .59]	**.42** **[.26, .56]** .55 [.39, .67]	**.62** **[.52, .70]** .64 [.54, .71]	**.39** **[.31, .44]** .50 [.49, .60]	**.28** **[.16, .38]** .40 [.30, .49]	**.42** **[.27, .55]** .53 [.40, .64]	**.32** **[.17, .46]** .42 [.28, .55]	**.37** **[.31, .43]** .21 [.04, .15]	**.41** **[.28, .52]** .33 [.18, .46]	**.39**
Avoidance-affect Anxiety (A) to Comfort (C)	**-.05** **[-.11, .02]** .32 [.26, .38]	**.15** **[.01, .29]** .40 [.25, .53]	**.16** **[-.00, .30]** .43 [.27, .55]	**-.21** **[-.35, -.06]** .27 [.10, .40]	**-.05** **[-.11, .03]** .37 [.30, .43]	**.04** **[-.07, .14]** .29 [.19, .38]	**.03** **[-.13, .18]** .35 [.22, .47]	**.13** **[-.03, .29]** .34 [.21, .47]	**-.05** **[-.12, .02]** .05 [-.02, .12]	**-.26** **[-.37, -.12]** .02 [-.13, .18]	**-.01**
Predicted pattern?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Valence items with raised activation (A and E)	**.13** **[.06, .20]** .42 [.35, .47]	**.24** **[.10, .37]** .49 [.38, .60]	**.21** **[.06, .36]** .51 [.37, .65]	**.38** **[.24, .50]** .55 [.45, .64]	**.13** **[.06, .20]** .49 [.43, .54]	**.08** **[-.02, .18]** .35 [.25, .43]	**.15** **[-.02, .34]** .47 [.35, .58]	**.23** **[.08, .37]** .43 [.30, .54]	**.13** **[.06, .20]** .18 [.10, .24]	**.09** **[-.02, .21]** .21 [.06, .35]	**.18**
Valence items with low activation (D and C)	**.12** **[.05, .19]** .41 [.35, 47]	**.06** **[-.10, .24]** .45 [.30, .57]	**.24** **[.06, .41]** .52 [.35, .66]	**-.07** **[-.25, .09]** .44 [.28, .56]	**.12** **[.05, .19]** .45 [.39, .52]	**.16** **[.06, .26]** .36 [.25, .47]	**.16** **[-.01, .31]** .47 [.34, .58]	**.10** **[-.09, .28]** .38 [.23, .51]	**.12** **[.05, .19]** .10 [.02, .17]	**.02** **[-.11, .13]** .18 [.02, .32]	**.10**

Average correlation with valence	**.13**	**.15**	**.22**	**.16**	**.13**	**.12**	**.15**	**.16**	**.13**	**.05**	**.14**
Activation with positive valence (E and C)	**.24** [.15, .28] .38 [.31, .43]	**.37** [.25, .48] .50 [.38, .60]	**.30** [.17, .44] .42 [.27, .56]	**.40** [.29, .50] .53 [.43, .61]	**.22** [.15, .28] .41 [.35, .47]	**.31** [.20, .41] .37 [.28, .47]	**.38** [.24, .49] .51 [.38, .61]	**.21** [.06, .34] .31 [.16, .44]	**.22** [.15, .28] .22 [.16, .28]	**.25** [.10, .37] .25 [.09, .37]	**.29**
Activation with negative valence (A and D)	**.23** [.16, .30] .37 [.31, .44]	**.10** [-.10, .23] .37 [.21, .49]	**.43** [.25, .57] .49 [.32, .63]	**.09** [-.06, .23] .38 [.23, .50]	**.24** [.17, .30] .44 [.37, .59]	**-.13** [-.23, -.01] -.24 [-.35, -.11]	**.09** [-.05, .23] .37 [.22, .50]	**.34** [.16, .49] .39 [.25, .51]	**-.10** [.16, .30] .03 [-.05, .10]	**-.08** [-.22, .07] .10 [-.07, .25]	**.12**
Average correlation with activation	**.24**	**.23**	**.36**	**.24**	**.23**	**.09**	**.24**	**.27**	**.06**	**-.09**	**.19**

Notes: Negative affects have been reverse-scored, and controls have been applied for other affect quadrants, sex and age. Difference between Approach- and Avoidance-affects: $p < .05$ or beyond. Controlled correlations are indicated in bold font.

Table 3. Negative and threatening features: Controlled correlations with approach-affect, avoidance-affect, valence and activation scores and their corresponding confidence intervals at 95%, in brackets, are presented in bold font. Uncontrolled correlations and their confidence intervals at 95%, in brackets, are shown below the controlled correlations and their confidence intervals.

Form of job affect	Negative and threatening feature				Mean controlled correlation
	Financial pressure (Study 4)	Job insecurity (Study 4)	Time pressure (Study 2)	Unmanag-eable demands (Study 4)	
Approach-affect Depression (D) to Enthusiasm (E)	**-.12** **[-.27, .03]** -.21 [-.35, -.06]	**.00** **[-.15, .17]** -.06 [-.21, .11]	**.15** **[.05, .25]** -.01 [-.09, .12]	**-.28** **[-.41, -.10]** -.49 [-.61, -.36]	**-.06**
Avoidance-affect Anxiety (A) to Comfort (C)	**-.10** **[-.25, .03]** -.21 [-.36, -.06]	**-.05** **[-.24, .10]** -.08 [-.24, .09]	**-.21** **[-.29, -.11]** -.14 [-.24, -.04]	**-.36** **[-.50, -.22]** -.55 [-.65, -.43]	**-.18**
Predicted pattern?	Yes, but *ns*	Yes, but *ns*	Yes	Yes	Yes
Valence with raised activation (A and E)	**-.06** **[-.21, .08]** -.21 [-.35, -.06]	**.12** **[-.01, .24]** -.03 [-.17, .13]	**.02** **[-.07, .10]** -.06 [-.16, .04]	**-.24** **[-.36, -.12]** -.54 [-.64, -.44]	**-.04**
Valence with low activation (D and C)	**-.10** **[-.26, .07]** -.22 [-.37, -.07]	**-.16** **[-.28, -.01]** -.12 [-.28, .06]	**-.06** **[-.18, .03]** -.09 [-.19, .02]	**-.25** **[-.39, -.10]** -.55 [-.66, -.43]	**-.14**
Average correlation with valence	**-.08**	**-.02**	**-.02**	**-.25**	**-.09**
Activation with positive valence (E and C)	**-.05** **[-.20, .10]** -.12 [-.28, .03]	**.08** **[-.06, .22]** .01 [.00, .08]	**-.03** **[-.13, .06]** -.05 [-.15, .05]	**-.08** **[-.24, .06]** -.26 [-.43, -.10]	**-.02**
Activation with negative valence (A and D)	**-.24** **[-.38, -.08]** -.27 [-.40, -.12]	**-.13** **[-.28, .01]** -.12 [-.27, .05]	**.05** **[-.05, .16]** .08 [-.03, .18]	**-.64** **[-.73, -.51]** -.68 [-.76, -.59]	**-.24**
Average correlation with activation	**-.15**	**-.03**	**.01**	**-.36**	**-.13**

Notes. Negative affects have been reverse-scored, and controls have been applied for other affect quadrants, gender, and age. Difference between Approach- and Avoidance-affects: $p < .05$ or beyond. Controlled correlations are indicated in bold font.

Table 4. Negative but non-threatening features. Controlled correlations with approach-affect, avoidance-affect, valence and activation scores and their corresponding confidence intervals at 95%, in brackets, are presented in bold font. Uncontrolled correlations and their confidence intervals at 95%, in brackets, are shown below the controlled correlations and their confidence intervals.

Form of job affect	Negative but not personally threatening feature		
	Boring activities (Study 3)	Unused qualifications (Study 3)	Mean controlled correlation
Approach-affect Depression (D) to Enthusiasm (E)	**-.74** **[-.80, -.67]** -.75 [-.81, -.68]	**-.43** **[-.54, -.31]** -.36 [-.49, -.23]	**-.58**
Avoidance-affect Anxiety (A) to Comfort (C)	**.28** **[.14, .42]** -.33 [-.45, -.18]	**.28** **[.12, .42]** -.04 [-.20, .11]	**.28**
Predicted pattern?	Yes	Yes	Yes
Valence with raised activation (A and E)	**-.23** **[-.39, -.04]** -.60 [-.68, -.49]	**-.06** **[-.22, .09]** -.23 [-.36, -.07]	**-.14**
Valence with low activation (D and C)	**-.18** **[-.38, .04]** -.58 [-.69, -.45]	**-.06** **[-.23, .12]** -.22 [-.36, -.06]	**-.12**
Average correlation with valence	**-.20**	**-.06**	**-.13**
Activation with positive valence (E and C)	**-.47** **[-.57, -.35]** -.62 [-.70, -.51]	**-.22** **[-.35, -.07]** -.27 [-.41, -.10]	**-.34**
Activation with negative valence (A and D)	**-.14** **[-.30, .02]** -.47 [-.59, -.33]	**-.05** **[-.12, .21]** -.14 [-.29, .02]	**-.09**
Average correlation with activation	**-.30**	**-.13**	**-.21**

Notes: Negative affects have been reverse-scored, and controls have been applied for other affect quadrants, sex, and age. Difference between Approach- and Avoidance-affects: $p < .05$ or beyond. Controlled correlations are indicated in bold font.

Appendix: The Multi-Affect Indicator

Affects were measured through the questionnaire set out below. The focus here was on job-related affect, but with amended instructions the Affect Indicator can record feelings in any setting. The Enthusiasm quadrant is represented by items 1, 5, 9 and 13, Comfort by 3, 7, 11 and 15, Anxiety by 2, 6, 10 and 14, and Depression by 4, 8, 12 and 16.

Feelings *[for instance, 'at Work']*

For *[e.g., 'the past week']*, please indicate below approximately how often you have felt the following while you were *[e.g., 'working in your jo*b'*]*. Everyone has a lot of overlapping feelings, so you'll have a total for all the items that is much greater than 100% of the time.

		Approximate amount of your time *[e.g., 'at work']* in *[e.g., 'the past week']*						
		Never	**A little of the time**	**Some of the time**	**About half the time**	**Much of the time**	**A lot of the time**	**Always**
	I have felt:	0% of the time	1% to roughly 20%	Roughly 21% to 40%	Roughly 41% to 60%	Roughly 61% to 80%	Roughly 81% to 99%	100% of the time
1	Enthusiastic							
2	Nervous							
3	Calm							
4	Depressed							
5	Joyful							
6	Anxious							
7	Relaxed							
8	Dejected							
9	Inspired							
10	Tense							
11	Laid-back							
12	Despondent							
13	Excited							
14	Worried							
15	At ease							
16	Hopeless							