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Four-quadrant investigation of job-related affects and behaviours

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Four-Quadrant Investigation of Job-related Affects and Behaviours

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Abstract

Emphasizing differences in activation as well as valence, six studies across a range of situations examined relations between types of job-related core affect and 13 self-reported work behaviours. A theory-based measure of affect was developed, and its four-quadrant structure was found to be supported across studies. Also consistent with hypotheses, high-activation pleasant affect was more strongly correlated with positive behaviours than were low-activation pleasant feelings, and those associations tended to be greatest for discretionary behaviours in contrast to routine task proficiency. Additionally as predicted, unpleasant job-related affects that had low rather than high activation were more strongly linked to the negative work behaviours examined. Theory and practice would benefit from greater differentiation between affects and between behaviours.

Affects are "primitive, universal, and simple, irreducible on the mental plane" (Russell, 2003, p. 148), "single feeling[s] at a slice in time" (Yik, Russell, & Steiger, 2011, p.705), and are central to many psychological constructs such as mood, emotion, well-being, happiness, satisfaction, and strain. Early research into workers' affect focussed on associations with potential environmental antecedents such as personal discretion, workload, social support and so on (reviewed, for example, by Warr, 2007), but links with work behaviours have increasingly received attention. This paper identifies limitations in knowledge about affect-behaviour links, and extends research through theory-based differentiation between types of each. Four types of affect will be compared in tests of hypotheses about their associations with two categories of job behaviour. The paper goes beyond earlier affect-and-behaviour publications in its comprehensive examination of multiple forms of affect and in its comparison between those forms in relation to theoretically-distinct kinds of behaviour. This extension is important, for example, to identify affect-behaviour relationships which may have been obscured in previous less-differentiated research.

Our focus is on different forms of what Russell (e.g., 1980, 2003) refers to as "core affect" – "that neurophysiological state consciously accessible as the simplest raw (non-reflective) feelings" (2003, p. 148). Core affect can exist without being given a label or attributed to any cause, and is considered by Russell and others to represent an integral blend of two primary attributes – pleasure and arousal.

Those are shown as horizontal and vertical dimensions respectively within the circumplex in Figure 1 (e.g., Remington, Fabrigar, & Visser, 2000; Russell, 1980, 2003; Seo, Feldman Barrett, & Bartunek, 2004; Yik, Russell, & Feldman Barrett, 1999; Yik et al., 2011). The horizontal dimension, ranging from unpleasant to pleasant, covers affective valence; and the vertical arousal dimension, from low to high mental activation, concerns a person's "state of readiness for action or energy expenditure" (Russell, 2003, p.156). A related notion has been viewed by laboratory researchers as "motivational intensity" or "the impetus to act"

(Gable & Harmon-Jones, 2010, p. 323), and in Thayer's (1989) biopsychological model, the upper two quadrants are viewed as "tense arousal" and "energetic arousal".

INSERT FIGURE 1 HERE

Illustrative feelings in relation to the two core affect dimensions are located around the outside of Figure 1, and summary labels are indicated in each quadrant: High-activation unpleasant affect (HAUA) such as anxiety; high-activation pleasant affect (HAPA) for example enthusiasm; low-activation unpleasant affect (LAUA) illustrated by depression; and low-activation pleasant affect (LAPA) such as feeling comfortable.

Core affect is present in specific emotions in combination with particular cognitions. For example, anger, fear, distress, and jealousy all contain unpleasant, high-activation feelings. However, although they are similar in containing core affect those emotions differ from each other and from core affect in containing additional elements peculiar to themselves. Particular emotions involve their own kinds of cognitions and behavioural tendencies over and above their constituent core feelings (e.g., Lerner & Keltner, 2000; Yik et al., 2011). For example, when viewing pride as feeling good about oneself, the feelings involved represent instances of core affect whereas the self-focus is an additional cognitive component (Russell, 2003, p. 148). These partial content differences mean that different emotions are associated with behaviours in different ways. For example, the emotion of hostility may be linked to counterproductive work behaviour (Judge, Scott, & Ilies, 2006), but that particular association is not expected for every other emotion. The study of a particular emotion (e.g., hostility) is different from examination both of other emotions (e.g., guilt) and of the core feelings that are affect alone.

In studying core affect it is thus necessary to use instruments which do not additionally assess the content of specific emotions. Measures have varied in that respect. For instance, scales by Burke, Brief, George, Roberson, and Webster (1989), Daniels (2000), Van Katwyk, Fox, Spector, and Kelloway (2000) and Watson, Clark, and Tellegen (1988) contain core-affect items but also a range of emotion-linked terms such as *aggressive*, *annoyed*, *confused*, *disgusted* and *proud*, whereas instruments by Warr (1990) and others are restricted to feelings that vary only in their valence and activation. The present studies take the latter approach, in order to examine only "primitive, universal and simple" feelings – the ones that can be common to all specific emotions – rather than also the additional elements that can vary between those emotions.

Another important conceptual issue in this area is the overlap between a "mood" and an "emotion". Researchers have disagreed in their use of these terms, and the distinction between them is generally agreed to be "blurry" (George, 2011, p. 148). The two constructs can be broadly distinguished in respect of intensity (emotions are generally more intense), duration (emotions tend to be briefer) and specificity (emotions are more targeted on particular features or people) (e.g., Cropanzano, Weiss, Hale, & Reb, 2003). For example, one might experience "anger" either as an emotion in response to a particular event (e.g., insulting behaviour by a customer) or as a generalized "bad mood" over a longer period. Russell (2003) defined mood as "prolonged core affect with no object or with a quasi-object" (p. 147). In many cases of affect it is arguable which is the more appropriate label (a mood or an emotion), and moods themselves contain emotions. The emphasis here is upon the nature of the constituent feelings within both of those.

ASSESSING CORE AFFECT AT WORK

Drawing on the circumplex framework, how should core affect in work settings be measured? Researchers (not themselves studying links with behaviour) have explored alternative factorial structures and assessment dimensions (e.g., Cropanzano et al., 2003; Remington et al., 2000; Russell, 1979, 1980, 2003; Watson & Tellegen, 1985, 1999; Yik et al., 2011), typically envisaging measurement axes across sections of Figure 1 – either diagonal (e.g., bottom-left to top-right) or horizontal (i.e., all unpleasant versus all pleasant).

However, the few investigators focussing on the four separate sections (Burke et al., 1989; Mäkikangas, Feldt, & Kinnunen, 2007; Van Katwyk et al., 2000) have all reported that between-affect correlations particularly support a four-quadrant interpretation. For example, Mäkikangas et al. (2007) concluded from a longitudinal study of managers that the "four-factor solution showed a better approximation with the data than the alternative models at both time points" (p. 213). Burke et al. (1989) described how the "confirmed four factors" (p. 1097) are paralleled by both neurological processes and clinical syndromes. A four-quadrant perspective offers greater specificity of analysis and precision of prediction, and will be adopted here. We provide the first examination of diverse work behaviours as a function of all four kinds of core affect.

Several previous studies of links with behaviour have been directed at "positive affect" or (less often) "negative affect". These might be expected to cover all feelings on the right-hand or left-hand side of the figure, involving all levels of activation. However, that has rarely been the case, in part because many measures have been based on the Positive and Negative Affect Schedule (PANAS) created by Watson et al. (1988). Those investigators (see also Watson, 1988; Watson & Tellegen, 1985) viewed positive affect (PA) and negative affect (NA) in terms of diagonal axes from LAUA to HAPA and HAUA to LAPA respectively. However, their PANAS scales were restricted to high-PA and high-NA quadrants only, containing activated positive terms such as *enthusiastic*, *excited* and *inspired* and activated negative terms such as *distressed*, *jittery* and *nervous*.

Thus, although the two PANAS scales are often referred to as measuring "positive affect" (PA) and "negative affect" (NA), they in fact tap only certain kinds of those affects – feelings in the two upper segments of Figure 1 (e.g., Remington et al., 2000). This restricted coverage was later recognized by the scales' originators. For example, they indicated 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, in practice these more appropriate labels have rarely been used in that way.

Research described as linking positive affect to behaviour has thus frequently been restricted to the upper right-hand quadrant in Figure 1, whereas pleasantness extends through both sections on that side of the figure. Likewise, investigations of unpleasant affect using only PANAS items do not allow for the possibility that low-activation negative feelings differ in causes or consequences from the activated forms which alone are covered by that instrument. For example, Wright and Staw (1999), Dalal, Lam, Weiss, Welch, and Hulin (2009, Study 2), Fritz and Sonnentag (2009) and Foo, Uy, and Baron (2009) used PANAS (i.e., activated) items for positive and negative affect, and Tsai, Chen, and Liu (2007) supplemented the positive PANAS items with other activated terms – *cheerful*, *delighted*, *happy* and *joyful*. George and Zhou (2007) used all 20 PANAS items, and Den Hartog and Belschak (2007) drew items mainly from that set. In order to assess a wider range of activation new, more comprehensive scales of affect will be applied here.

Based on these theoretical and practical arguments and on initial empirical support, we hypothesise the following:

Hypothesis 1: A four-quadrant model of affect which differentiates high-activation unpleasant affect, high-activation pleasant affect, low-activation unpleasant affect, and low-activation pleasant affect provides a better fit to empirical data than do alternative models of affect.

Assuming the above hypothesis is correct, the quadrants' relationships with other variables require investigation. In the next section, we view the four quadrants in relation to each other, and additionally focus upon possible variations between types of work behaviour. Overarching theoretical perspectives are lacking about between-behaviour differences, and a framework will be introduced in terms of both valence and discretionary content.

PREDICTIONS ABOUT CORE AFFECTS AND BEHAVIOURS

The valence of behaviours can be examined as their desirability versus undesirability to an individual or organization, recognizing that in certain cases those two assessments do not fully coincide. Thus positive behaviours include task performance, proactivity, initiative-taking, meeting targets, and citizenship contributions of many kinds. On the other hand, negative work behaviours include effort withdrawal or disengagement, theft, sabotage, workplace violence, bullying, incivility, and other "counterproductive" activities. Those harm the organization, either directly by affecting its functioning or property or indirectly by reducing the effectiveness of other employees (Fox, Spector, & Miles, 2001).

In addition to differences between behaviours in terms of valence, it is important to distinguish between those which are required by a role and the more spontaneous, discretionary activities that exceed core obligations (Katz, 1964). An example of the latter is citizenship behaviour, such as helping others or expressing loyalty to the organization (Smith, Organ, & Near, 1983). In a similar vein, scholars have distinguished "extra-role" from in-role behaviour, with the former referring to positive, discretionary activities that are not specified in advance nor clearly recognized by formal reward and punishment systems (e.g., Van Dyne & LePine, 1998). Personal discretion is also fundamental to proactivity – self-initiated behaviour aimed at bringing about a change in the environment (e.g., Parker, Bindl, & Strauss, 2010), such as when taking charge of a situation (Morrison & Phelps, 1999) or using one's personal initiative (Frese & Fay, 2001). As expanded later, we expect that affect-types will relate differently to discretion-based behaviours compared to routine in-role performance (Borman & Motowidlo, 1993) and task proficiency (Griffin, Neal, & Parker, 2007), which focus on carrying out pre-specified requirements.

Hypothesis 2 proposes that links between pleasant affect and positive behaviours will be stronger for pleasant feelings that are activated rather than less activated. Those feelings (HAPA in Figure 1) have energizing potential that builds upon personal resources and can encourage approach behaviour. Energy within this kind of affect is likely to be important to self-start and to sustain challenging change activity, perhaps in the face of resistance and set-backs (Bindl & Parker, 2010). On the other hand, pleasant feelings with low activation (LAPA) are instead expected to be less related to positive behaviours. Feelings of that kind contain no impetus for action, generating reflection more than activity (Frijda, 1986) and in some circumstances broadening cognition rather than targeting attention on personal goal-attainment (Gable & Harmon-Jones, 2010).

Activated pleasant feelings are central to several models of self-regulation addressed primarily to behaviour outside organizations. For instance, Carver and Scheier's (1998) framework embodies an affective feedback loop through which successful behaviour towards a target gives rise to feelings in terms specifically of activated elation; and Higgins's (1997) regulatory focus theory argues that successful approach behaviours are linked to pleasant feelings that are especially characterized by cheerfulness and similar activated states. In respect of positive activity, both self-regulation models thus emphasize the top-right (HAPA) quadrant of Figure 1.

Hypothesis 2 has received partial support from some previous research. Pleasant feelings that are activated (but described in original reports as "positive affect" as a whole) were found to be significantly associated with self-reported personal initiative by Den Hartog and Belschak (2007) and Fritz and Sonnentag (2009), and with manager-rated proactive behaviour by Tsai et al. (2007) and Parker, Collins, and Grant (2008). Significant associations with high-activation pleasant affect have also been reported for self-reported entrepreneurial effort (Foo et al., 2009), proactive goal regulation (Bindl, Parker, Totterdell, & Hagger-Johnson, 2012), and citizenship behaviours (Dalal et al., 2009; Tsai et al., 2007). However, these studies did not examine the full range of pleasant affect, and research that contrasts the two quadrants in their association with a wide range of positive work behaviours is still required. That empirical comparison will be made here.

Hypothesis 2: The relationships of pleasant affect with positive behaviours are stronger for pleasant affect that is activated (HAPA) than for pleasant affect with low activation (LAPA).

Hypothesis 3 differentiates between behaviours. Links between activated pleasant feelings and positive behaviours (above) are expected to be strongest for behaviours that are more discretionary – with self-set goals that require personal initiative, effort and perhaps risk-taking, as in proactive suggestion-making and undertaking citizenship activities beyond prescribed requirements.

This theme was central to George and Brief's (1992) model of positive mood at work – viewed as having "the most effect on behaviors that are performed of one's own free will" (p. 324). Mischel (e.g., 1977) argued that the impact of within-person variables depends on "situational strength", such that personal states were more influential in "weak" situations – when more mental and behavioural options were available. Similarly, Spector and Fox (2002) emphasized that behaviours that are voluntary leave "far more room for the action of personal intentions than more constrained and routinized task-related job performance" (p. 270). In empirical terms, affect-related comparisons between high- and low-discretion behaviours are lacking, and we extend previous research by comparing observed patterns for the two kinds of behaviour.

Hypothesis 3: The relationships of high-activation pleasant affect with positive behaviours are stronger for positive behaviours that are more discretionary than for positive behaviours that are less discretionary.

Hypothesis 4 concerns core affect that is low in pleasure. It proposes that associations between unpleasant affect and negative behaviours tend to be stronger for negative feelings that are of low rather than high activation. In terms of Figure 1, many negative job behaviours are thus predicted to be more correlated with core job-related affect in the bottom-left

quadrant (low-activated and unpleasant) than in the top-left quadrant (high activation and unpleasant).

This reversal for negative behaviours of the Hypothesis-2 emphasis on more activated affect for positive activities may initially appear counterintuitive, but it is in fact central to several established perspectives and reflects the fact that low-activation unpleasant affect (LAUA) is the diagonal opposite of pleasant affect that is activated (HAPA). Lazarus (1991) emphasized that unpleasant affect with low activation is primarily linked to the loss or absence of something desired which requires action for its replacement, and laboratory studies have identified contrasting associations with unpleasant feelings of low- versus high-activation. For instance, Raghunathan and Pham (1999) found that high-activation unpleasant affect such as anxiety primed behaviours likely to reduce uncertainty, whereas low-activation unpleasant affect (sadness) tended towards the remediation of perceived deficits.

In addition, at the heart of general models by Carver and Scheier (1998) and Higgins (1997) is the notion that a deficiency of desirable features and poor progress towards a goal generates unpleasant feelings that have low rather than high activation. Affect with low activation as well as low pleasure is viewed as being associated particularly with the absence of something that is wanted and which requires action for its attainment. Although depressed (LAUA) feelings linked to non-attainment of goals can in extreme cases lead to behavioural disengagement from a situation, total withdrawal (apart from quitting a job) is not possible for workers constrained by role demands and task targets. Depressed feelings at work are thus likely to be associated with those forms of personal withdrawal that are possible, such as distancing oneself from others (social withdrawal) or reducing one's involvement in a situation (effort withdrawal or silence).

Hypothesis 4: The relationships of unpleasant affect with negative behaviours are stronger for unpleasant affect that is of low activation (LAUA) than for high-activation unpleasant affect (HAUA).

Note that this hypothesized importance for negative behaviours of low-activation unpleasant core affect does not extend to all kinds of emotion. As described earlier, the present perspective is restricted to core feelings alone whereas specific emotions also have content that is additional to the core and differs between emotions. For example, the activated emotion of hostility can predict counterproductive work behaviours (e.g., Judge et al., 2006), but the content of hostility is dissimilar from other emotions such as, for instance, shame or guilt, for which different predictions may be appropriate, and also goes beyond the core affect under investigation here. Different hypotheses and investigations are needed for different emotions in relation to different behaviours.

Yik et al. (2011, p.710) identify a general agreement that "no single measure of fit for structural models should be relied on exclusively", and previous studies have used indicators comprising either two or four sectors of Figure 1. In addition to testing hypotheses about the four quadrants individually (above), those multi-quadrant indicators also require examination to learn about findings' descriptive comparability with other research. Relationships with behaviours will therefore also be summarized for two kinds of dual-quadrant measure. First, measures of all pleasant affect and of all unpleasant affect have been computed, ranging across both activation quadrants for a single direction of valence. We thus combined HAUA and LAUA scores into a comprehensive index of unpleasant affect, and HAPA and LAPA into pleasant affect as a whole.

Second, we examined the two-quadrant axes identified by Watson and colleagues (above), combining diagonally-opposite low- and high-activation affects – HAUA with LAPA and LAUA with HAPA. Those axes are central to much affect theorising (e.g., Watson et al., 1988) and also to the self-regulation models of Higgins (1997) and Carver and Scheier (1998) and the overall happiness framework of Warr (2007). For example, Higgins's (1997) regulatory focus theory treats self-regulation as either promotion-focused or prevention-focused. When a person is promotion-focused, he or she is oriented towards approach behaviour and "emotional experience varies along a cheerful-dejected dimension" (Brockner & Higgins, 2001, p. 39) – described here as running from HAPA to LAUA. However when a person is prevention-focused, tending towards avoidance of a situation, the pattern is different: "emotional reactions vary along a quiescence-agitation dimension" (p. 39) – described here as from LAPA to HAUA (see also Carver, 2003). After reversing the direction of negative feelings, diagonal two-quadrant compound scores were computed to represent Anxiety-Comfort (reversed-HAUA and LAPA) and Depression-Enthusiasm (reversed-LAUA and HAPA).

Finally, in order to provide descriptive information about overall affect, responses from all quadrants were brought together into a global feeling-good score (again reverse-scoring the negative items). Van Katwyk et al. (2000) suggested that this four-quadrant index "offers the most comprehensive assessment" (p. 224), and the "single, integral blend" of both pleasure and activation is central to the model of Seo et al. (2004; see p. 426). We expect that combining together responses from pairs of quadrants or from all quadrants will reduce measurement sensitivity in comparison with the four separate scores.

METHOD

The paper's hypotheses were tested in six separate studies, covering 13 different work behaviours in relation to the four quadrants of affect in Figure 1.

Participants

Study 1 was an internet survey through a website offering free advice from an international consulting company about assessment processes for staff recruitment and development. Respondents were from several different countries (65% in the United Kingdom), and analyses were restricted to members of the employed sub-sample who indicated that English was their first language ($N = 168$). Ages ranged from 18 to 65 (mean 41 years), 47% were male, 69% had received a college or university education, and 51% held supervisory or managerial positions. Principal business areas were financial services, manufacturing, technology and the public sector.

Participants in Study 2 were 713 employed respondents to a second website survey, again selected from the full sample as having English as their primary language. Almost half (47%) were based in UK, 49% were male, and their average age was 37 years. 67% had received a college or university education, and 43% held supervisory or managerial positions. Principal business areas were finance, retail, banking, health-care, manufacturing, and the public sector.

Study 3 obtained responses from 1646 workers through a subsequent survey on the same website. Ages ranged from 17 to 66 (mean 33 years), 56% were male, 65% had received a college or university education, and 41% held supervisory or managerial positions.

Their principal business areas were sales, administration, finance, and customer service, and all used English as their first language.

Study 4 was conducted with customer service representatives in a multinational energy company in the United Kingdom. From an overall population of 694 in that group, 225 volunteers (32%) completed questionnaires during working time. Their average age was 34 years (range 18 to 61) and 66% were female. Company tenure ranged from one year to 34 years, with an average of 4.43 years.

Study 5 respondents were 186 trainee doctors in a British medical school, who volunteered their participation and received individual feedback. Response rate was 74%, and ages ranged from 18 to 30 years around an average of 19; 63% were female[1].

Study 6 involved 1121 workers responding to a fourth internet survey. All used English as their first language, their average age was 36, 51% were male, and 60% had received a college or university education. Principal business areas were finance, banking, manufacturing, retail and the public sector, and 50% held supervisory or managerial positions. As in Studies 1, 2 and 3, it was not possible to ascertain response rates, since the overall population of possible respondents cannot be known.

Behaviour measurement

Thirteen work behaviours, selected to range across activities of organizational concern and theoretical diversity, were described on multi-item scales by workers themselves. In order to create acceptably short questionnaires when studying a wide variety of behaviours, each investigation covered only a sub-set of those. The allocation of measures and response options to studies is shown in Table 1.

INSERT TABLE 1 ABOUT HERE

The first column of that table sets out the positive behaviours examined. More discretionary behaviours were measured in the two forms introduced earlier, proactivity and organizational citizenship, and less discretionary "in-role" behaviours were investigated in terms of the proficient fulfilment of job requirements. Negative work behaviours (in the right-hand column) were studied through three kinds of counterproductive activity and disengaged silence.

Positive behaviours. Task proactivity was measured by the three-item scale developed by Griffin et al. (2007), involving personal anticipation of future possibilities and the initiation of action to change an aspect of a situation. Items (in respect of the past month) included "I came up with ways to improve the way my core tasks were done". The following more specific proactive behaviours were also examined. *Active Voice* was tapped through four items derived from Van Dyne and LePine (1998), such as "Spoken up in your work unit with ideas for new projects or changes in procedures". *Taking Charge* was covered by three items from Morrison and Phelps's (1999) measure, such as "How frequently do you try to bring about improved procedures in your work-place?", with Study-5 items worded in relation to the training environment. Three items each tapped two types of self-initiated proactive work behaviours identified by Parker and Collins (2010): *Strategic Scanning* and *Problem Prevention*, for instance asking "How frequently do you actively scan the environment to see how what is happening might affect the company in the future?" and

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[1] A separate subset of material from Studies 4 and 5 has been used by Bindl et al. (2012) to examine a different set of issues.

"How frequently do you spend time planning how to prevent re-occurring problems?" respectively.

Constructs and scales of organizational citizenship were based on conceptualizations by Organ and Ryan (1995) and Van Scotter and Motowidlo (1996). *Extra-role Contribution*, *Altruism,* and *Organizational Advocacy* over the past two months were each tapped by three items such as, respectively, "I used my own initiative to complete tasks that are not formally part of the job", "I made a special effort to help colleagues", and "I enjoy telling others what's great about my organization" (Inceoglu & Fleck, 2010).

The final positive behaviour in Table 1 is routine *Task Proficiency*, defined by Griffin et al. (2007) as effective performance largely responsive to external requirements. This less discretionary form of activity was assessed by the three-item scale of those investigators, with items such as "I completed my core tasks well using the standard procedures". Slight modifications were made in Study 4 (adding an item) and in Study 5 (ensuring appropriateness to the educational setting).

Negative behaviours. Table 1 also lists the negatively-oriented behaviours which were examined. Based on previous research (e.g., Fox & Spector, 1999), an initial set of 16 items covered counterproductive work behaviours which might be expected to occur in the settings investigated. Principal-axis factoring and oblimin rotation yielded three factors, and after omission of cross-loading items three separable scales were created. *Effort Withdrawal* was measured through three items such as "I tried to avoid tasks by pretending I was busy", and *Social Withdrawal* (three items) included "I went out of my way to avoid people". *Minor Theft* was tapped by three items such as "I used the organization's materials or equipment for my own personal benefit rather than for work tasks".

In addition, a seven-item scale recorded *Disengaged Silence* in the past month, based on the conceptualization by Van Dyne, Ang, and Botero (2003). This contained items like "Stayed silent even though you had some ideas for improving things" and "Gone along with the majority view because you were too demotivated to do otherwise".

Affect measurement

Covering the four circumplex sections of Figure 1, 28 organizationally appropriate affect-descriptors were selected from previous publications (e.g., Burke et al., 1989; Remington et al., 2000; Russell, 1980; Van Katwyk et al., 2000; Warr, 1990; Watson & Tellegen, 1985). In order to ensure that the item-set remained within the focal construct of core affect (see earlier), terms were excluded which denote specific emotions with additional content beyond merely valence and activation – feelings of disgust, guilt, hostility, shame and so on.

Research participants were asked about their feelings at work in the past week (Studies 1, 2, 3 and 6) or past month (Studies 4 and 5), with response options of: *Never (0% of the time)*, *A little of the time (1% to roughly 20%)*, *Some of the time (Roughly 21% to 40%)*, *About half the time (Roughly 41% to 60%)*, *Much of the time (Roughly 61% to 80%)*, *A lot of the time (Roughly 81% to 99%)*, and *Always (100% of the time)*. Overall instructions were "For the past week, please indicate below approximately how often you have felt the following while you were working in your job. 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".

The original 28 items were presented in Studies 1, 4 and 6, and response patterns were analysed according to conventional scale-construction procedures (e.g., Hinkin, 1998). Items from this initial set were omitted if they had low variance or biased distributions or if they were strongly correlated with others in different quadrants. Following exploratory factor analyses, the item-set was reduced to 16 with four terms in each quadrant, and the appropriateness of the hypothesized four-quadrant model was examined through confirmatory analyses as described below.

The final 16 items in the Multi-Affect Indicator can be completed very rapidly and all are acceptable to organizations. High-activation unpleasant affect (HAUA in Figure 1) is measured by *anxious*, *nervous*, *tense* and *worried*, and high-activation pleasant affect (HAPA) by *enthusiastic*, *excited*, *inspired* and *joyful*. Low-activation unpleasant affect (LAUA) is indicated by *dejected*, *depressed*, *despondent* and *hopeless*, and low-activation pleasant affect (LAPA) by *at ease*, *calm*, *laid-back* and *relaxed*. Items in use are sequenced randomly, and items denoting unpleasant feelings are reverse-scored so that higher values always indicate greater pleasantness. Table 2 shows that the four scales are highly reliable, with alpha coefficients ranging from .80 to .87 (HAUA), from .78 to .90 (HAPA), from .82 to .89 (LAUA) and from .75 to .86 (LAPA).

RESULTS

In the following sections, we first test Hypothesis 1 by examining the predicted four-factor structure of affect, and then report findings in respect of Hypotheses 2 to 4 about affect-behaviour associations. In addition, for comparison with other investigations descriptive patterns are summarized in the appendixes. Appendix 1 presents an overview of each behaviour-type as a function of the four separate affect-quadrants, and Appendix 2 reports those patterns in respect of the three multi-quadrant combinations described earlier.

Structure of affect

As expected from affects' common evaluative emphasis and from previous research, the affect quadrants were found to be positively intercorrelated (recall that negative feelings have been reverse-scored, so that higher values always indicate better well-being). Table 2 shows that correlations are low between the two activated quadrants (reversed HAUA and HAPA) and between the two low-activation sets (reversed LAUA and LAPA) (mean r across studies = .16 and .30 respectively); the two pleasant types of affect are on average intercorrelated .45; and for the two unpleasant quadrants the mean intercorrelation is .66.

INSERT TABLE 2 ABOUT HERE

Relatively greater overlap of the two unpleasant scores is expected from widespread everyday co-occurrence of high- and low-activation negative feelings and from the prevalence of clinical disorders identified as mixed anxiety and depression. For instance, in a study by Van Katwyk et al. (2000), the unpleasant quadrants (differently measured) were intercorrelated .78. To examine their statistical separation, and to test Hypothesis 1 that a four-factor solution is superior to alternative models, we conducted confirmatory factor analyses using maximum likelihood estimation in MPlus version 6 (Muthen & Muthen, 1998-2009), freeing the first factor loadings and setting factor variances at 1.00. To ensure reliability, confirmatory factor analyses require large samples; following the recommendation of MacCallum, Widaman, Preacher, and Hong (2001) that N should be at least 200, we examined the four studies above that threshold.

Table 3 shows that fit indices for the hypothesised four-factor model of affect (Model 1) were consistently acceptable against criteria recommended by Hu and Bentler (1999): CFI from .93 to .95, TLI .93 to .95, RMSEA .07 or .08, and SRMR .06 or .07. Further analyses within each study compared the four-factor model against alternative possible structures. Model 2 distinguished between pleasant and unpleasant affect only; Model 3 contained diagonal axes from HAUA to LAPA and LAUA to HAPA; Model 4 separated high versus low activation only; and Model 5 specified one overall affect only. These comparative analyses showed that the hypothesised four-factor solution had a significantly better fit to the data in each case ($\Delta\chi^2$ was significant at $p < .05$ for each of the model comparisons, see Table 3), consistent with findings by Burke et al. (1989), Mäkikangas et al. (2007) and Van Katwyk et al. (2000). Findings thus support Hypothesis 1[2].

INSERT TABLE 3 ABOUT HERE

Affect-behaviour associations

We tested our hypotheses regarding affect-behaviour relationships (Hypotheses 2 to 4) across six independent analyses, which incrementally built on and extended one another. Findings are reported in Tables 4 to 9. Starting with Studies 1 and 2 we first tested Hypothesis 2, predicting a stronger association of activated, rather than low-activation, pleasant feelings with positive work behaviours. In Studies 3 to 5, we replicated the tests of Hypothesis 2 and additionally tested Hypothesis 3, that associations of activated pleasant affect with positive behaviours are stronger for positive behaviours that are more discretionary than for behaviours that are less discretionary. As described in the Method section, tests were made across a wide range of organisational settings, including a multi-employer survey (Study 3), call centre representatives in a multinational energy provider (Study 4), and trainee medical doctors (Study 5). Finally, in analysis of Study 6 we further broadened the perspective to include negative work behaviours and to test all of Hypotheses 2 to 4.

In all cases, hypothesis-testing was through structural equation models. Using version 6.1 of MPlus (Muthen & Muthen, 1998-2009), we compared each hypothesized model with competing models that constrained as equal the paths to be tested for each hypothesis, as outlined below for each study. Following the recommendation of Howell (2007), in all models we used list-wise deletion leading to slight reductions in sample size; *N*'s for each analysis are indicated in Tables 4 to 9. In order to keep the parameter estimates per responses to reasonable levels, we analysed our smaller samples (Studies 1, 4, and 5) using observed mean scores. We corrected for measurement error in these analyses, estimated as [1 minus internal reliability] multiplied by the observed variance of the scale. In analyses of our larger samples (Studies 2, 3 and 6) we used latent mean scores. In all models, we allowed the respective independent variables, as well as dependent variables, to correlate in order to assess the unique relationships between a specific type of affect and a particular work behaviour.

Analyses of Studies 1 and 2

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[2] Because readers might be concerned about the scale having some ordinal properties, we additionally replicated the CFAs using items' polychoric correlation matrix in combination with Weighted Least Squares estimation (WLMRV) in MPlus version 6. All of these additional analyses provided strong support for our hypothesized four-factor affect structure in comparison to alternative affect structures.

We started by testing Hypothesis 2, which proposed that links between pleasant affects and positive behaviours would be stronger for high-activation pleasant affect (HAPA) than for low-activation pleasant affect (LAPA). We controlled for age, gender, and educational level in our analyses[3]. Results consistently supported the hypothesis, as we outline next.

In Study 1 (see Table 4), the hypothesized model had a good fit to the data, with χ^2 = 12.51, TLI = .90, RMSEA = .08, SRMR = .06, and CFI = .97. Standardized path coefficients, indicating the strength of association between activated pleasant affect and the positive behaviours of extra-role contribution and organizational advocacy, were γ = .48 ($p < .001$) and γ = .72 ($p < .001$) respectively, averaging to a mean of .60 (see Figure 2).

Furthermore, path coefficients for the association of low-activation pleasant affect with those same behaviours were much lower and non-significant: γ = .06 and γ = .04, with a mean of only .05 (see Figure 2). Statistical significance was assessed by comparing the freely estimated, hypothesized model (Model 1) with a competing model in which the paths of high-activation and low-activation pleasant affect in relation to each positive behaviour were constrained to be equal. Results were again supportive: the constrained model (Model 2) had a significantly poorer fit to the data compared to the freely estimated model ($\Delta\chi^2$ = 17.59, $p < .05$; see Table 4).

INSERT FIGURE 2 ABOUT HERE

INSERT TABLE 4 ABOUT HERE

Similarly, in Study 2 (see Table 5) the hypothesized model had a good fit to the data, with χ^2 = 959.64, TLI = .92, RMSEA = .05, SRMR = .06, and CFI = .93. Additionally, standardized path coefficients for the association of activated pleasant affect with the positive behaviours of extra-role contribution, organizational advocacy, and task proactivity, were .48, .59 and .64 respectively ($p < .001$ in each case), averaging to .57 (see Figure 3). In contrast, path coefficients of low-activation pleasant affect with positive behaviours were weak and non-significant, with path coefficient values of -.06, .03 and -.14 respectively and an average of .08. In further support of Hypothesis 2, the constrained model had a significantly poorer fit to the data than the hypothesized model ($\Delta\chi^2$ = 41.6, $p < .05$; see Table 5). As expected, associations of pleasant affect with positive behaviours were significantly stronger for activated, as compared to low-activation, affect.

INSERT FIGURE 3 ABOUT HERE

INSERT TABLE 5 ABOUT HERE

Analyses of Studies 3, 4, and 5

In the next analysis, we tested Hypothesis 3 as well as seeking to replicate findings for Hypothesis 2. Starting with Study 3 (see Table 6), we again controlled for age, gender, and educational level, as well as for LAUA and HAUA. Our hypothesized model had a good fit to the data, with χ^2 = 2026.69, TLI = .93, RMSEA = .05, SRMR = .05, and CFI = .94. In further support of Hypothesis 2, the association with positive behaviours of high-activation pleasant affect (HAPA) was again stronger than that of low-activation pleasant affect (LAPA).

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[3] Other affect quadrants outside a stated hypothesis were also controlled in all analyses, except for Study 1. In that case, high between-variable correlations rendered the extra control inappropriate. (In all the other studies, patterns were almost identical with and without control for the additional quadrants.)

Standardized path coefficients of high-activation pleasant affect with extra-role contribution, organizational advocacy, task proactivity and proficiency were .59, .66, .50 and .32 respectively ($p < .001$ in all cases), yielding a mean controlled association of HAPA with positive behaviours of .52. In contrast, individual associations of low-activation pleasant affect with extra-role contribution, organizational advocacy, task proactivity, and proficiency were $\gamma = -.09$, $\gamma = -.05$, $\gamma = -.01$, and $\gamma = .08$ (all *ns*), averaging -.02 (see Figure 4). Additionally, the constrained model in which paths from high-activation and low-activation positive affect to all positive behaviours were held equal (Model 2), had a significantly worse fit to the data than the freely estimated hypothesized Model 1 ($\Delta\chi^2 = 90.82$, $p < .05$; see Table 6). Hypothesis 2 was fully supported.

Hypothesis 3 proposed that the relationship between high-activation pleasant affect and positive work behaviours would be stronger for more discretionary positive behaviours than for less discretionary positive behaviours. In initial support of this hypothesis, mean path coefficients for high-activation pleasant affect with high-discretion versus low-discretion positive behaviours were .58 and .32 respectively. More precisely, the constrained model, in which paths from high-activation positive affect to both high- and low-discretion positive behaviours were held equal (Model 3), had a significantly worse fit to the data than the freely estimated hypothesized Model 1 ($\Delta\chi^2 = 53.70$, $p < .05$; see Table 6). Hypothesis 3 was thus fully supported in Study 3.

INSERT FIGURE 4 ABOUT HERE

INSERT TABLE 6 ABOUT HERE

In Study 4 the hypothesized model (Model 1) had an acceptable fit to the data, with $\chi^2 = 21.40$, TLI = .87, RMSEA = .09, SRMR = .03, and CFI = .98 (see Table 7). Given that the sample was educationally more homogeneous than Studies 1 to 3, analyses controlled for age and gender but not for educational level. In further support of Hypothesis 2, the association with positive behaviours of high-activation pleasant affect was again stronger than that of low-activation pleasant affect. The average standardized path coefficient for the association of high-activation pleasant affect with positive behaviours was .55. Individual associations (shown in Figure 5) were as follows: HAPA and Voice $\gamma = .66$ ($p < .001$); HAPA and Proficiency $\gamma = .30$ ($p < .05$); HAPA and Strategic Scanning $\gamma = .48$ ($p < .001$); HAPA and Problem Prevention $\gamma = .68$ ($p < .001$); and HAPA and Taking Charge $\gamma = .62$ ($p < .001$). In contrast, the average controlled association of low-activation pleasant affect with positive behaviours was -.17. Individual associations were all non-significant, and as follows: LAPA and Voice $\gamma = -.15$; LAPA and Proficiency $\gamma = -.20$; LAPA and Strategic Scanning $\gamma = -.07$; LAPA and Problem Prevention $\gamma = -.24$; and LAPA and Taking Charge $\gamma = -.20$. In full support of Hypothesis 2 in Study 4, the constrained model (Model 2), assuming equal associations of HAPA and LAPA with positive work behaviours, had a significantly poorer fit to the data compared to the freely estimated model ($\Delta\chi^2 = 18.35$, $p < .05$; see Table 7).

Hypothesis 3, which proposed that the average association between activated pleasant affect and behaviours that are more discretionary would be larger than the association between that affect and core task proficiency, was also fully supported in Study 4. The mean path coefficient of HAPA with more discretionary behaviours was much larger than with less discretionary behaviours: .61 versus .30. Additionally, Model 3, constraining paths between HAPA and both high- and low-discretion behaviours to be equal, had a significantly poorer fit to the data than the hypothesized model ($\Delta\chi^2 = 18.89$, $p < .05$; see Table 7).

INSERT FIGURE 5 ABOUT HERE

INSERT TABLE 7 ABOUT HERE

In Study 5 (see Table 8), the hypothesized model (Model 1) had a good fit to the data, with $\chi^2 = 7.69$, TLI = .99, RMSEA = .00, SRMR = .03, and CFI = .99. We again controlled for age and gender in our analyses. In line with Hypothesis 2, activated pleasant affect was in Study 5 overall more strongly associated with positive behaviours than was low-activation pleasant affect (mean path coefficients across behaviours were .43 and -.15 respectively). Standardized path coefficients between HAPA and positive behaviours were: HAPA and Voice $\gamma = .41$ ($p < .01$); HAPA and Task Proficiency $\gamma = .52$ ($p < .01$); HAPA and Taking Charge $\gamma = .35$ ($p < .01$). And coefficients between LAPA and positive behaviours were (LAPA and Voice $\gamma = -.13$; LAPA and Task Proficiency $\gamma = -.17$; LAPA and Taking Charge $\gamma = -.15$; all ns) (see Figure 6). Additionally, the constrained model in which paths from high-activation and low-activation positive affect to all positive behaviours were held equal (Model 2), had as a tendency a worse fit to the data than the freely estimated hypothesized Model 1 ($\Delta\chi^2 = 7.41$, $p < .10$, see Table 8, Model 2). Hypothesis 2 was thus as a tendency supported in Study 5.

However, in this study support was not present for Hypothesis 3, that high-activation pleasant affect is more strongly associated with high-discretion behaviours than with less discretionary behaviours. Mean path coefficients between HAPA and the two kinds of behaviour were similar (.43 and .52 for high-discretion and low-discretion respectively), and the comparison between Models 1 and 3 was not significant ($\Delta\chi^2 = .43$; see Table 8). The specific context of this study, in which students described their behaviour in a medical setting, might lend itself to relatively high discretion even in core proficient behaviours – hence lending some support for Hypothesis 2 but not Hypothesis 3.

INSERT FIGURE 6 ABOUT HERE

INSERT TABLE 8 ABOUT HERE

Analysis of Study 6

In addition to the previous studies, Study 6's coverage of negative as well as positive work behaviours allowed a comprehensive test of Hypotheses 2 to 4. Again controlling for age, gender, and educational level, Table 9 shows that the hypothesized model (Model 1) had a good fit to the data, with $\chi^2 = 2334.87$, TLI = .93, RMSEA = .04, SRMR = .05, and CFI = .94.

In full support of Hypothesis 2, activated pleasant affect was substantially more strongly related to positive behaviours (mean $\gamma = .48$) than was low-activation pleasant affect (mean $\gamma = .11$). Standardized path coefficients were: HAPA and Task Proactivity $\gamma = .51$ ($p < .001$); HAPA and Proficiency $\gamma = .18$ ($p < .01$); HAPA and Extra-role Contribution $\gamma = .62$ ($p < .001$); and HAPA and Organizational Advocacy $\gamma = .56$ ($p < .001$) (see Figure 7). In contrast, individual associations of low-activation pleasant affect with positive behaviours were: LAPA and Task Proactivity $\gamma = -.02$ (ns); LAPA and Proficiency $\gamma = .25$ ($p < .001$); LAPA and Extra-role Contribution $\gamma = .09$ (ns); and LAPA and Organizational Advocacy $\gamma = .08$ (ns). Additionally, the constrained model (Model 2) had a significantly poorer fit to the data compared to the freely estimated model ($\Delta\chi^2 = 381.35$, $p < .05$; see Table 9).

Consistent with Hypothesis 3, high-activation pleasant affect was more strongly associated with high-discretion positive behaviour than with low-discretion positive behaviour (mean γ = .56 versus .18). Additionally, the constrained model (Model 3) again had a significantly worse fit ($\Delta \chi^2$ = 51.96, p < .05; see Table 9).

Next we examined Hypothesis 4, that the relationship between unpleasant affects and negative behaviours would be stronger for low-activation unpleasant affect (LAUA) than for high-activation unpleasant affect (HAUA). Individual associations of low-activation unpleasant affect with negative behaviours were: LAUA and Effort Withdrawal γ = .66 (p < .001); LAUA and Social Withdrawal γ = .64 (p < .001); LAUA and Minor Theft γ = .32 (p < .01); and LAUA and Disengaged Silence γ = .56 (p < .001). In contrast, individual associations of high-activation unpleasant affect with negative behaviours were: HAUA and Effort Withdrawal γ = -.26 (p < .05); HAUA and Social Withdrawal γ = -.14 (*ns*); HAUA and Minor Theft γ =-.03 (*ns*); and HAUA and Disengaged Silence γ = -.05 (*ns*). As expected, path coefficients for the relationship of low-activation unpleasant affect with negative behaviours (mean = .55) were stronger than for unpleasant affect that is activated (mean = -.12). In further support of Hypothesis 4, the constrained Model 4, in which the relationship between low-activation and high-activation unpleasant affect with each negative work behaviour was forced to be equal, showed a significantly poorer fit than the freely estimated hypothesized model ($\Delta\chi^2$ = 342.25, p < .05, see Table 9). Hypotheses 2 to 4 were thus fully supported in Study 6.

INSERT FIGURE 7 ABOUT HERE

INSERT TABLE 9 ABOUT HERE

In sum, findings from the six studies were consistent with the paper's differentiated hypotheses about affects and behaviours. Hypothesis 2 (HAPA versus LAPA in relation to positive behaviours) was fully supported in all Studies 1, 2, 3, 4, 5, and 6; Hypothesis 3 (high-discretion versus low-discretion behaviours) was fully supported in Study 3, 4 and 6; but not in Study 5 with its highly selected sample in a training-related setting; Hypothesis 4 (LAUA versus HAUA in relation to negative behaviours) was fully supported in Study 6.

Previously-applied forms of measurement

This paper is unique in its emphasis on separate affect quadrants in relation to a range of work behaviours. In addition, recognising that other researchers have instead applied measures which combine quadrants from Figure 1, comparable multi-quadrant information from the present investigations is provided here. That is set out in two Appendixes.

These subsidiary presentations do not seek to test the paper's hypotheses, but instead provide summary material from the six studies in a form which can be compared with established alternative perspectives. In parallel with the multi-variable controls required for hypothesis-testing above, separate analyses have been run for the four affect quadrants and for commonly-applied two-quadrant measures. As well as bivariate affect-behaviour correlations, multiple regressions have examined each behaviour as a function of a focal affect indicator and the other affect measures in an analysis. Separate computations were run for each positive behaviour (23 analyses) and for each negative behaviour (four analyses). (The allocation of behaviours to studies has been summarized in Table 1.)

Appendix 1 summarizes patterns from the six studies in respect of the four affect quadrants which have been examined in the paper's hypothesis-tests. First is the number of significant independent effects for each focal affect found in multiple regressions after controlling for the other three quadrants. Second (in brackets) is the average uncontrolled correlation between each quadrant singly and each type of behaviour[4]. Appendix 2 summarizes findings for two forms of dual-quadrant indicator as well as (in the final column) the variance accounted for by overall four-quadrant affect.

First in Appendix 2 are overall pleasant affects and unpleasant affects, examined as combinations of the two right-hand and the two left-hand segments of Figure 1. The left-hand columns make it clear that overall pleasant affect was more often independently associated with positive behaviours than was overall unpleasant affect (19 of 23 versus five of 23 $p <$ .001 relationships controlling for the other affect), but that the two valence directions were equally often associated with the studied negative behaviours (four of four significant coefficients in each case). Similarly, Appendix 2 compares between the diagonal axes in Figure 1 from LAUA to HAPA and from HAUA to LAPA, which were labelled by Watson and Tellegen (1985) and Watson et al. (1988) as "positive affect" and "negative affect" respectively. As described earlier, these are central to several research perspectives, including those of Carver and Scheier (1998), Higgins (1997) and Warr (2007). However, relationships of these axes with work behaviours have not previously been investigated.

The penultimate columns of Appendix 2 show that feelings along the LAUA-HAPA axis more strongly predict work behaviours than do HAUA-LAPA scores. The 23 multiple regressions in respect of positive behaviours yielded 20 significant independent effects (i.e., over and above the other affect axis) for LAUA-HAPA (as usual reversing the direction of unpleasant affects) but only two in respect of HAUA-LAPA. For the four negative behaviours, significant independent effects were present in four and two cases respectively. As also shown in Appendix 2, mean uncontrolled correlations with the LAUA-HAPA axis were consistently larger than with HAUA-LAPA: .35 and .17 for the 23 positive behaviours and -.45 and -.27 for the four negative behaviours. Using the original labels of Watson and colleagues, the axis of "positive affect" defined in their terms has greater predictive power in this study than the "negative affect" axis.

In addition, Appendix 2 reports the average variance accounted for (mean adjusted R-squared) in relation to each class of behaviour by each type of analysis. For comparison between all indicators, values for overall affect are also presented, combining the 16 items from all four quadrants. Across the six studies, more variance in behaviour scores was accounted for with increased differentiation of affect measurement. For the nine positive behaviours (on the top row of Appendix 2) mean adjusted R-squared values from the regression analyses are shown to be .11 for the overall four-quadrant affect index, .14 and .15 for the two double-quadrant assessments, and (in Appendix 1) .19 when the quadrants were examined separately. In respect of the negative behaviours studied, those mean adjusted R-squared values were .18, .20, .21 and .23 respectively. Greatest predictive power was obtained by use of separate indicators for each quadrant, supporting the paper's emphasis on hypotheses and analyses which are differentiated by both activation and valence.

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[4] Although HAPA is shown in Appendix 1 to be strongly associated with negative behaviours as well as with positive behaviours, the more refined comparison in Study 6 of our freely estimated model with a model in which paths between HAPA and positive and negative behaviours are constrained equal revealed that HAPA is in these more controlled conditions significantly more strongly associated with positive behaviours than with negative ones (see also Figure 7).

DISCUSSION

This multi-study examination of affect-behaviour relationships is distinctive in comparing systematically between correlates of four affect types across all the circumflex framework and is unique in contrasting relations with behaviours that are either more or less discretionary. As shown in Tables 4 to 9 and Figures 2 to 7, all hypotheses received good support across six independent studies.

Tests of the present hypotheses require that the identified quadrants of affect can be meaningfully distinguished in empirical terms. A series of confirmatory factor analyses showed that the four-quadrant model was a significantly better fit to core-affect data than were other models, supporting Hypothesis 1 and providing a basis for subsequent analyses.

In support of Hypothesis 2, high-activation pleasant job feelings were found to be more strongly linked to positive work behaviours than were low-activation pleasant feelings, consistent with the paper's argument that activated positive feelings have energising potential that is likely to stimulate approach-oriented positive behaviour. It is thus important in future hypotheses and interpretations in this area to distinguish between levels of affective activation rather than merely considering pleasant or unpleasant feelings as a whole. Additionally, we found good evidence for Hypothesis 3 that proposed stronger links for high-activation pleasant affect with positive work behaviours that are more discretionary than with those that are less discretionary, as expected from discretionary behaviour's more frequent self-set goals and high levels of effort. Finally, links between core unpleasant affects and negative work behaviours were predicted and found to be stronger for low-activation negative feelings (LAUA) than for high-activation negative feelings (HAUA) (Hypothesis 4).

In addition to tests of these hypotheses, supplementary analyses showed for the first time that four-quadrant affect analyses accounted for more variance in work behaviours than did overall or dual-quadrant analyses, suggesting that less differentiated research in this area may have underestimated some associations. Furthermore, the LAUA-HAPA axis was found to be more closely associated with work behaviours than was HAUA-LAPA. As described earlier, these two axes (labelled as "positive affect" and "negative affect" respectively by Watson and colleagues) have typically been examined only in their activated forms through widespread use of PANAS items. In addition, previous applications of PANAS have often had a context-free rather than the current job-related focus, and the scales have not previously been studied in relation to diverse work behaviours.

Although research in this field has sometimes explored differences between the valence-direction of (usually activated) feelings, empirical comparisons between different levels of affect activation have so far been rare. A particularly important finding here was that low-activation (rather than activated) negative core affect most predicted the studied negative behaviours. As described earlier, this difference (proposed in Hypothesis 4) is consistent with laboratory results, and it also reflects clinical research findings about diagnosed depression (which includes LAUA as measured here) in comparison with (high-activation) anxiety (Clark, Beck, & Brown, 1989). In respect of associated job content, low-activation negative feelings tend to be linked to a restricted opportunity for personal control, whereas HAUA is found to be more a function of raised demands (Warr, 2007).

However, the negative behaviours studied here, reflecting a person's decision to withdraw involvement or to steal minor items, tend to be moderately rather than highly discretionary, and it would be useful also to test predictions about that variable in a wider

range of negative activity, for instance including strongly counter-normative volitional behaviours such as sabotage or explicit harassment.

The PANAS restriction to activated forms of affect is of particular concern for negative behaviours, since several of those have been shown here to be linked primarily to unpleasant affects that have low activation. The use of PANAS scales may thus underestimate the associations of negative affect with some behaviours. Moreover, low-activation positive feelings like calmness may be important for behaviours not considered here, such as some forms of creativity or negotiation. In addition, studies that use the PANAS to control for the potential confounding of dispositional affect are incomplete because low-activation affectivity is not included. Only through assessment of all four quadrants of Figure 1 will possible variations in patterns be fully investigated. To meet that need, this paper introduces a structurally-sound measure of affect which incorporates activation as well as valence.

Other avenues for research

These findings could usefully be extended through alternative methods of behaviour measurement. The present studies share with others in the area (e.g., Binnewies, Sonnentag, & Mojza, 2009; Dalal et al., 2009; Foo et al., 2009; Fox et al., 2001; Tsai et al., 2007) a restriction to behaviours reported by respondents themselves. Issues of common-method variance are undoubtedly of concern in these cases. However, that concern should not be overstated. Ratings by other people would be inappropriate in respect of several forms of behaviour studied here. Many key activities are inaccessible to raters, being either primarily within the person (e.g., strategic scanning or low active voice) or purposely concealed from other people (as are many counterproductive behaviours).

More generally, there are good reasons in this area for preferring self-reports to either objective indicators of work behaviour or ratings made by other people. In respect of potential objective indicators, available information is likely to be of a gross kind (output, sales, etc.) rather than detailing specific behaviours; and, in respect of behaviour-scores obtained from others, raters are often unable to observe a representative sample of episodes and can lack time or skill to make accurate judgments. Linked to that, observers' ratings are known to have only moderate between-person and across-time reliability.

Only a few studies of affect and job behaviour have examined indicators that are objective, but significant associations with affect have been found in relation to recorded absenteeism (e.g., Hardy, Woods, & Wall, 2003). In respect of ratings by supervisors, it is likely that associations of behaviours with affect-types will be lower than for ratings by workers themselves. For example, Den Hartog and Belschak (2007) reported correlations with activated pleasant affect of .43 ($p < .01$) and .24 ($p < .05$) for self-rated and supervisor-rated initiative-taking respectively.

It is also important to consider self-reports of behaviour in the light of the present hypotheses and analytic procedures. This paper does not seek to identify the strength of specific associations (the actual level of which might be influenced by rater source), but instead looks at differences between several simultaneous affect-behaviour relationships within the same sample of individuals. To the extent that common-method variance effects operate, their impact is presumably consistent within each person and thus cannot account for between-correlation differentials within the same people. Common-method effects cannot themselves explain, for example, our finding that core low-activation unpleasant affect was,

in the same sample of individuals, more strongly associated with the studied negative behaviours than was high-activation unpleasant affect.

This paper provides an overall framework through which additional predictions may be tested. It emphasizes the need to differentiate in theory and in research measurement between different forms of affect and behaviour, and appears to be the first to empirically examine affect-related differences in the discretion level of work behaviours – the degree to which they are self-initiated rather than meeting the demands of a role. The current in-general categorization of that variable could usefully be supplemented by discretion scores obtained directly from workers themselves, in order to capture discretion variation between different jobs and activities with the same title.

Research interpretations and models in this area tend to emphasize the causal importance of feelings rather than of behaviours, but in many cases bidirectional processes are likely. Hypotheses of the present kind still require testing longitudinally, for example through experience-sampling diaries. Attention should also be directed at potential antecedents of affect. For example, shorter-term feelings as studied here partly reflect continuing traits with the same content. A very small amount of research has compared the associations of either trait affect or state affect with job behaviour. Additional investigations into both trait and state affect would now be helpful, as would combined examination of relationships with both environmental and within-person variables; behaviours are likely to be influenced by job features as well as by affects.

As in most research areas, in-general main effects are likely to be accompanied by specific patterns in particular cases. (The fact that different emotions with their own specific content in addition to core affect are linked to behaviours in different ways has already been emphasized.) This paper's contribution to main-effect understanding in respect of core affect should be developed by studies of relevant contingency factors. For instance, despite a general association between pleasant affects and positive behaviours, in some circumstances positive behaviours can instead co-exist with negative feelings. When stressful environmental pressures demand effortful innovation or action, positive behaviour may be accompanied by negative feelings in response to environmental threat (e.g., Foo et al., 2009; James, Broderson, & Eisenberg, 2004).

In addition, interactions might be envisaged between affect-types or between affects and other variables. For example, pleasant and unpleasant feelings often co-exist in states of ambivalence, and the correlates of each might depend on the level of the other (e.g., George, 2011). Similarly, Parker et al. (2008) observed that activated positive feelings were related to certain behaviours only under conditions of low performance orientation. George and Zhou (2007) found that an interactive relationship with creativity depended on particular supportive circumstances. In that way, it might be that high-activation unpleasant affect (found to be relatively unimportant in the present studies) particularly motivates work behaviour in a restricted range of circumstances, for instance when some form of action is perceived as unavoidable or when a clear vision is communicated by organizational leaders.

Practical implications

The findings reported here point to the importance of organizational and job-design procedures to enhance workers' feelings. However, the demonstrated centrality of pleasant affect that is activated rather than of low activation leads to a recommended managerial emphasis on the top-right quadrant of Figure 1. In particular, high-discretion jobs that involve

initiative-taking and proactive contributions are likely to be better performed by staff whose job-related feelings are activated as well as positive. Those feelings may be enhanced through the creation of jobs (sometimes called "enriched") that include high but achievable job demands or require people (perhaps with unpleasant difficulty) to acquire new skills and knowledge. It may be that organisations should not strive for worker happiness in general, but instead should seek to promote *challenged* happiness; in that case, some negative feelings are also present within an overall positive experience. Rather than aiming simply for a satisfied workforce, a key goal for organizational managers is thus to create a culture of challenge, from which positively activated well-being and high performance might both be expected.

This theme may be viewed in terms of the conceptual distinction between job satisfaction and job engagement. Warr and Inceoglu (2012) argue that engagement (in the top-right quadrant of Figure 1) may be viewed as satisfaction-plus-motivation, whereas feelings of satisfaction alone are located more in the bottom-right quadrant. Satisfaction (more reactive) derives primarily from the attainment of what is wanted, but engagement (more active) also contains motive power – seeking to achieve wanted outcomes that have not yet been attained. Policies which merely aim to increase job satisfaction (giving people what they want) are unlikely to be organisationally adequate; more desirable (for employees as well as for employers) are job-engagement policies which are focussed on *motivated* satisfaction – where some wants are met by the job, but workers can achieve additional satisfaction only by effortful performance.

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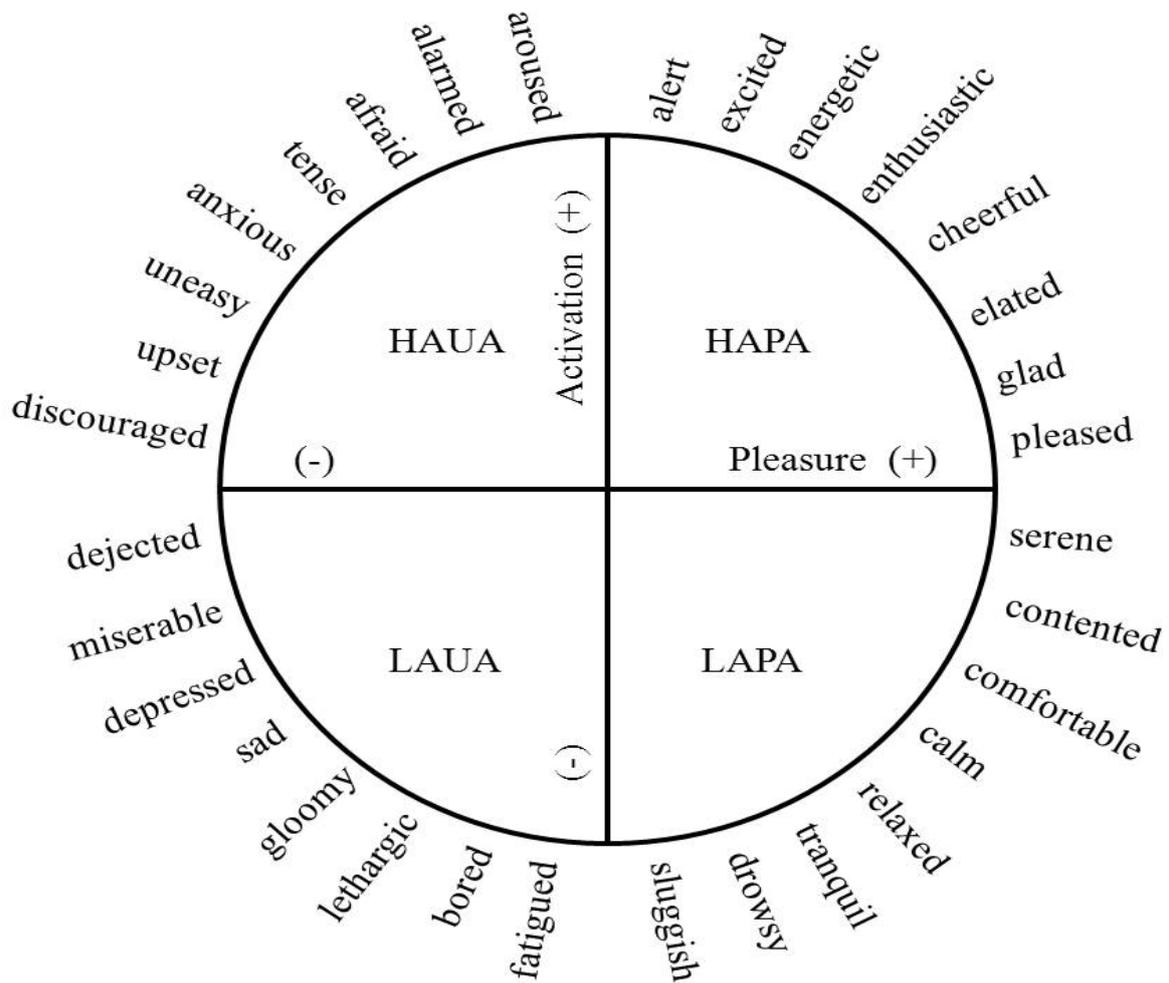
Figure 1. Some feelings and their locations within the affective circumplex

Note. Abbreviations are: HAUA, High-activation unpleasant affect, partly summarised as Anxiety; HAPA, High-activation pleasant affect, partly summarised as Enthusiasm; LAUA, Low-activation unpleasant affect, partly summarised as Depression; LAPA, Low-activation pleasant affect, partly summarised as Comfort.

Figure 2. Structural Equation Model Linking Pleasant Affect to Discretionary Behaviours- Study 1
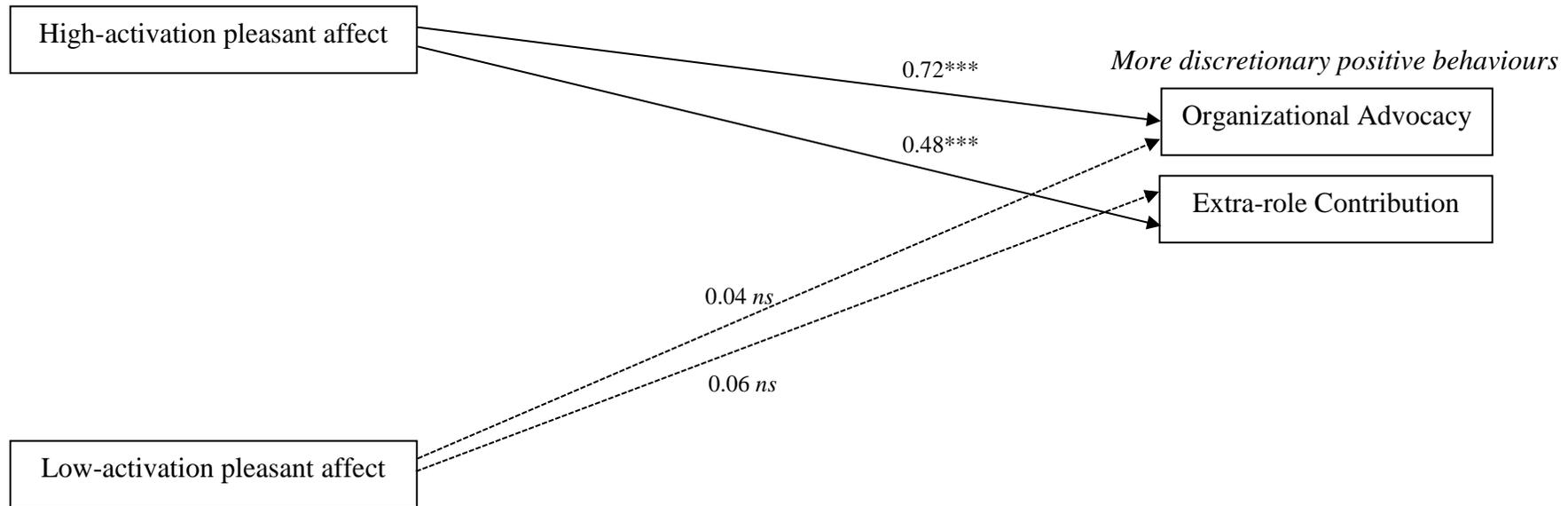
Notes: *N* = 166; * *p* < 0.05, ** *p* < 0.01, *** *p* < 0.001; two-tailed tested. Controls for age, gender, and education, as well as non-significant paths and correlations between affects and between behaviors, are omitted for parsimony.

Figure 3. Structural Equation Model Linking Pleasant Affect to Discretionary Behaviours - Study 2
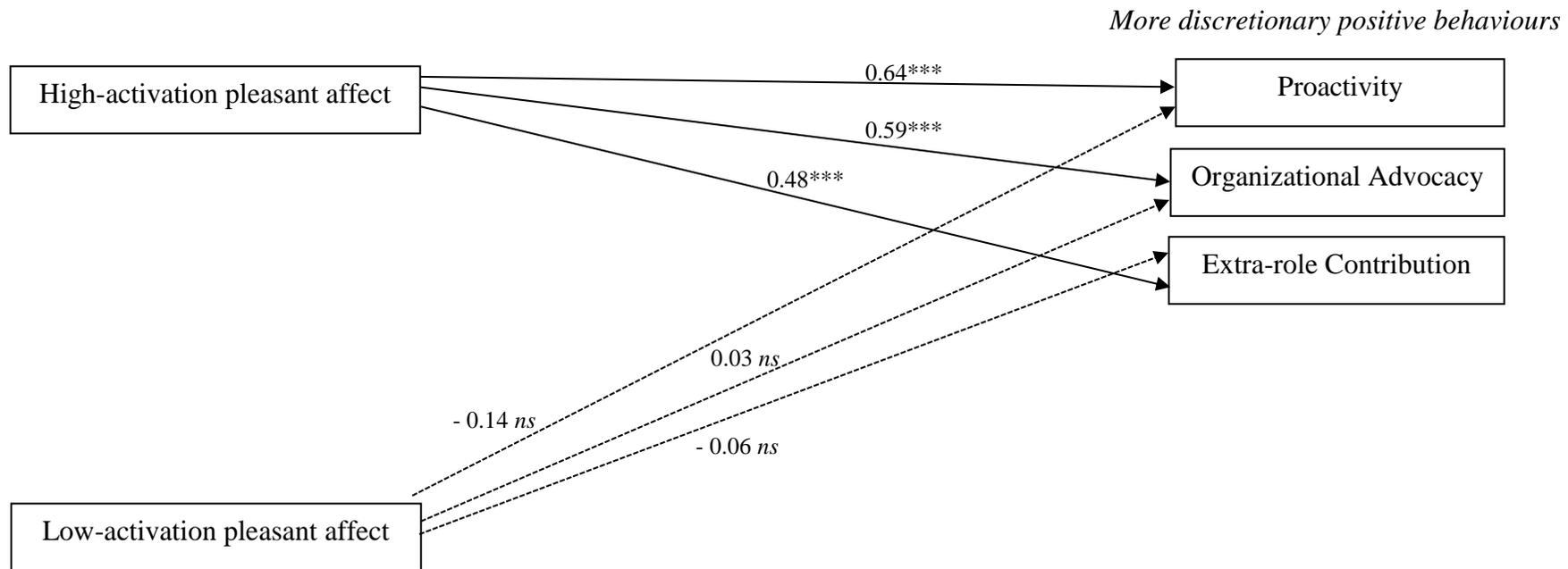
Notes: *N* = 678; * *p* < 0.05, ** *p* < 0.01, *** *p* < 0.001; two-tailed tested. Controls for age, gender, and education, HAUA and LAUA, as well as non-significant paths and correlations between affects and between behaviours, are omitted for parsimony.

Figure 4. Structural Equation Model Linking Pleasant Affect to Discretionary Behaviours - Study 3

More discretionary positive behaviours

High-activation pleasant affect

0.50***

0.66***

0.59***

0.32***

Proactivity

Organizational Advocacy

Extra-role Contribution

- 0.05 *ns*

- 0.01 *ns*

- 0.09 *ns*

Less discretionary positive behaviour

Low-activation pleasant affect

Proficiency

0.08 *ns*
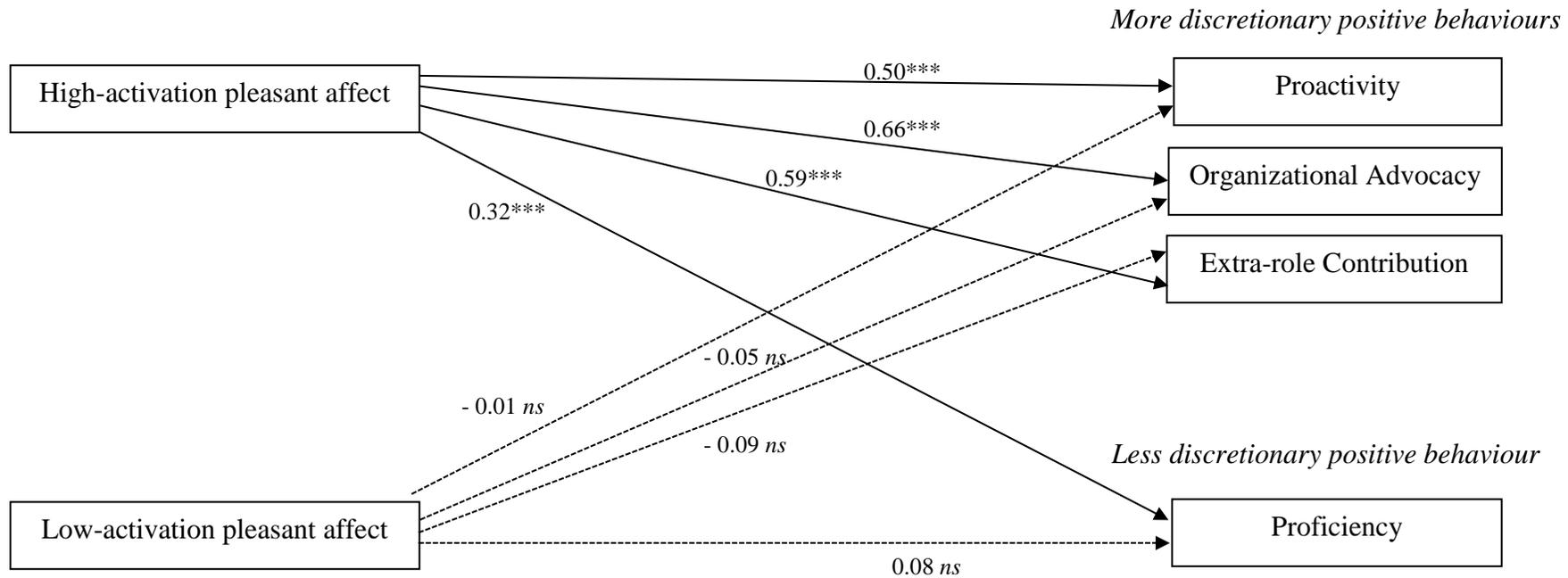
Notes: $N = 1577$; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; two-tailed tested. Controls for age, gender and education, HAUA and LAUA, as well as non-significant paths and correlations between affects and between behaviours, are omitted for parsimony.

Figure 5. Structural Equation Model Linking Pleasant Affect to More Discretionary and Less Discretionary Behaviours- Study 4
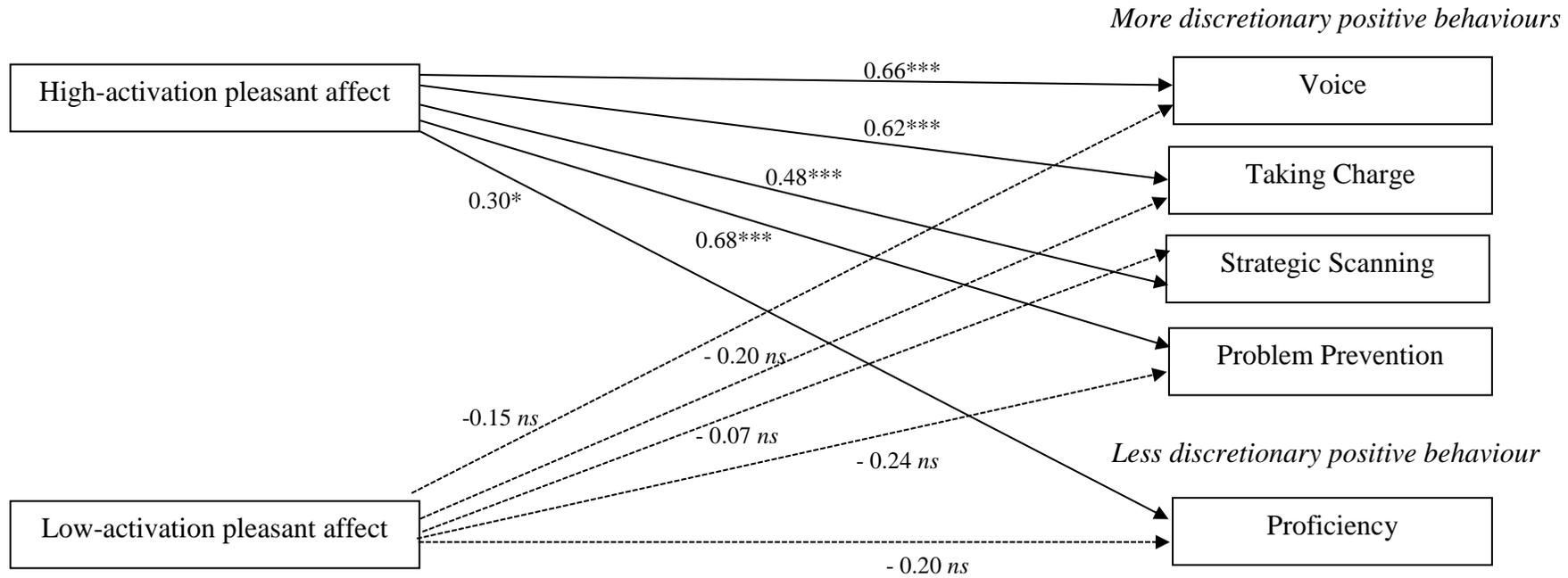
Notes: *N* = 225; * *p* < 0.05, ** *p* < 0.01, *** *p* < 0.001; two-tailed tested. Controls for age and gender, HAUA and LAUA, as well as non-significant paths and correlations between affects and between behaviours, are omitted for parsimony.

Figure 6. Structural Equation Model Linking Pleasant Affect to More Discretionary and Less Discretionary Behaviours- Study 5
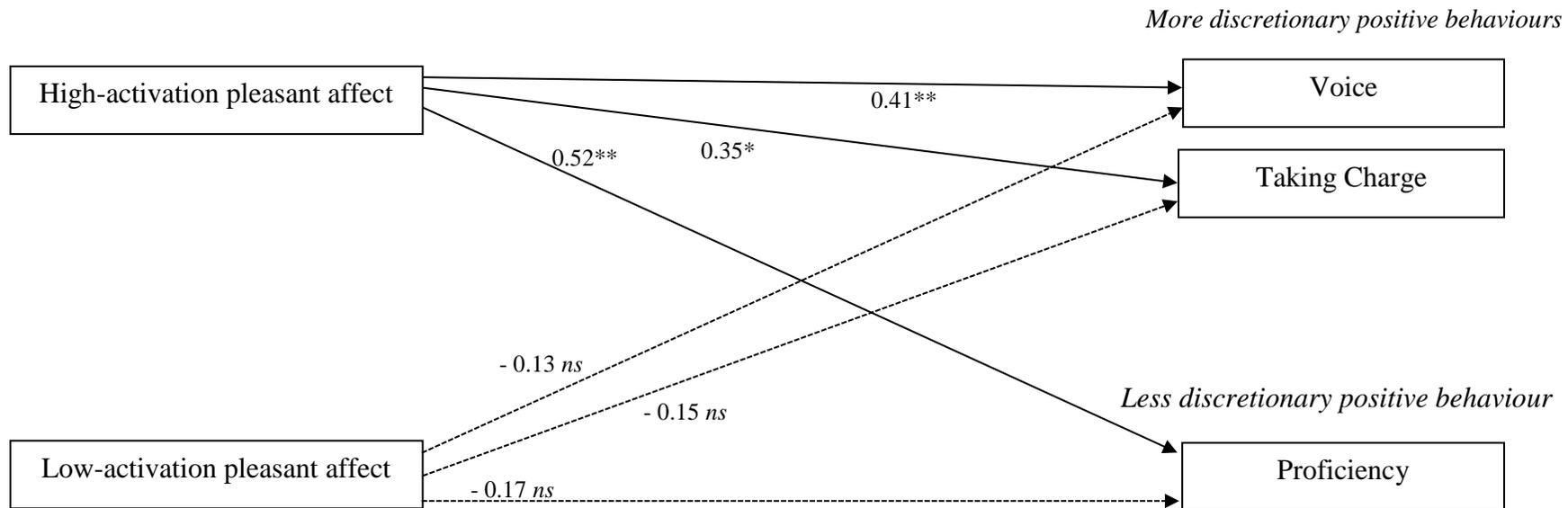
Notes: *N* = 162; * *p* < 0.05, ** *p* < 0.01, *** *p* < 0.001; two-tailed tested. Controls for age and gender, HAUA and LAUA, as well as non-significant paths and correlations between affects and between behaviours, are omitted for parsimony.

Figure 7. Structural Equation Model Linking Multiple Affects to Multiple Behaviours- Study 6
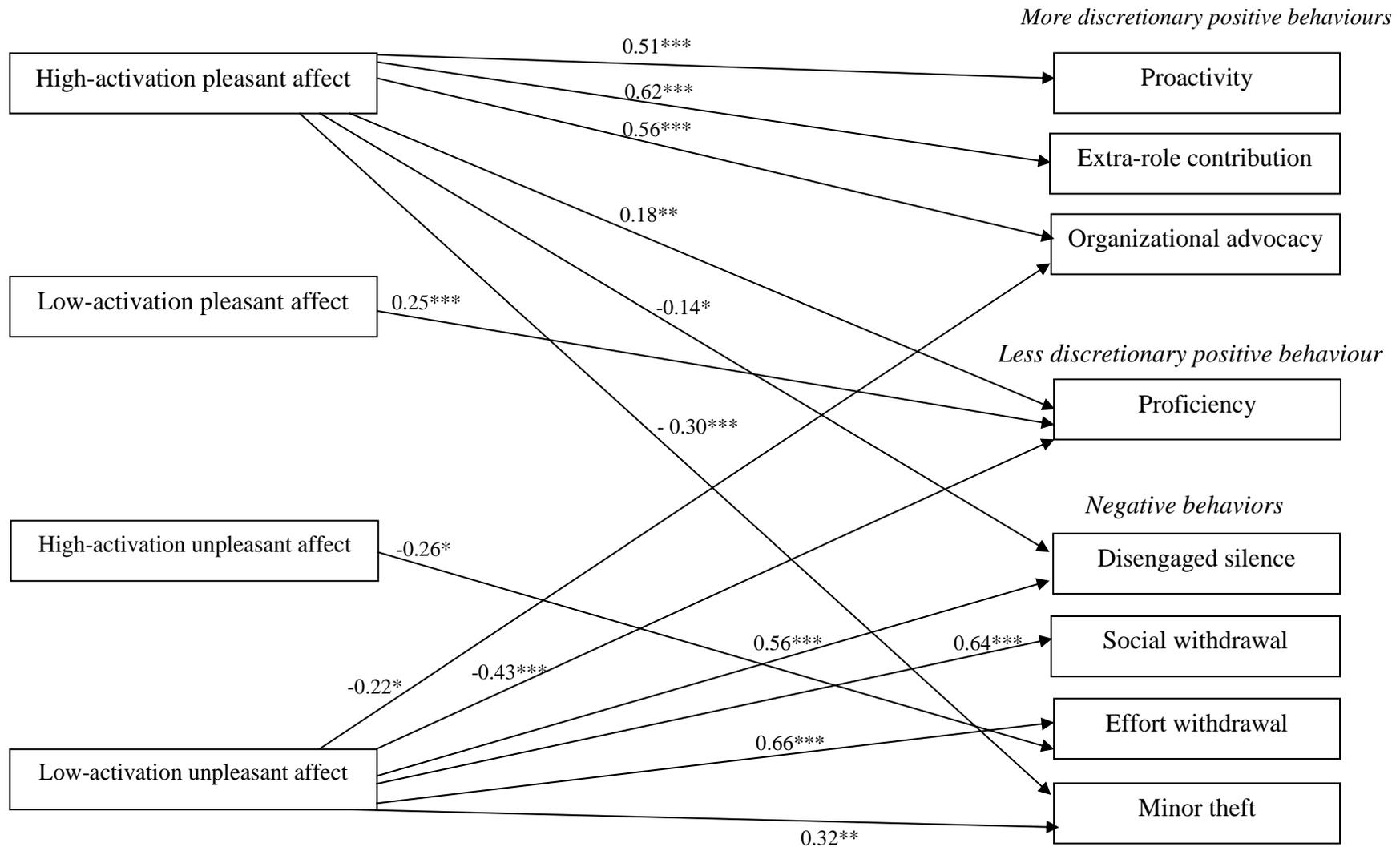
Notes: $N = 1091$; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; two-tailed tested. Controls for age, gender, and education, as well as non-significant paths and correlations between affects and between behaviours, are omitted for parsimony.

TABLE 1
Alpha coefficients of behaviours examined in each study

Positive behaviours		Negative behaviours	
Measure	Studies	Measure	Study
More discretionary: Proactive behaviours			
Task proactivity: .80, .83, .89 (RO1)	2, 3, 6	Effort withdrawal: .79 (RO1)	6
Active voice: .89, .81, .82 (RO4, RO1, RO1)	4, 5, 6	Social withdrawal: .82 (RO1)	6
		Minor theft: .81 (RO1)	6
Taking charge: .90, .90 (RO2, RO1)	4, 5	Disengaged silence: .85 (RO1)	6
Strategic scanning: .87 (RO2)	4		
Problem prevention: .84 (RO2)	4		
More discretionary: Organizational citizenship behaviours			
Extra-role contribution: .72, .78, .78, .73 (RO3)	1, 2, 3, 6		
Altruism: .81 (RO1)	6		
Organizational advocacy: .95, .91, .93, .88 (RO3)	1, 2, 3, 6		
Less discretionary: Routine behaviour			
Task proficiency: .84, .74, .71, .78 (RO1)	3, 4, 5, 6		

Notes. Response options (RO) are: RO1: five points from *not at all* to *a great deal*. RO2: five points from *very infrequently* to *very frequently*. RO3: nine points from *never* to *always*. RO4: five points from *never* to *always*. Study 1 $N = 168$; Study 2 $N = 713$; Study 3 $N = 1646$; Study 4 $N = 225$; Study 5 $N = 186$; Study 6 $N = 1121$.

TABLE 2

Affects of four kinds defined by activation as well as valence: Descriptive statistics

					Correlations with		
Affect type	Study	Mean	SD	Alpha	HAPA	LAPA	Reversed HAUA
Activated pleasant affect (HAPA)	1	4.02	1.33	.90			
	2	3.42	1.33	.89			
	3	4.04	1.40	.90			
	4	4.51	.97	.78			
	5	4.26	1.42	.79			
	6	4.18	1.32	.87			
Low-activation pleasant affect (LAPA)	1	4.00	1.23	.81	.39		
	2	3.88	1.19	.82	.43		
	3	4.17	1.21	.76	.49		
	4	4.11	1.14	.86	.41		
	5	4.38	1.23	.86	.39		
	6	4.17	1.16	.75	.56		
Reversed activated unpleasant affect (Reversed HAUA)	1	5.60	1.12	.83	.06	.50	
	2	5.68	1.00	.80	.08	.42	
	3	5.60	1.02	.81	.19	.39	
	4	4.98	1.05	.87	.15	.44	
	5	5.70	1.04	.87	.15	.49	
	6	5.81	.96	.81	.30	.46	
Reversed low-activation unpleasant affect (Reversed LAUA)	1	6.13	1.07	.89	.43	.40	.57
	2	5.75	1.14	.84	.42	.32	.56
	3	6.17	1.04	.87	.37	.25	.62
	4	6.01	.89	.82	.19	.20	.70
	5	6.25	1.08	.82	.20	.23	.71
	6	6.29	.99	.88	.53	.40	.71

Note. Study 1 $N = 168$; Study 2 $N = 713$; Study 3 $N = 1646$; Study 4 $N = 225$; Study 5 $N = 186$; Study 6 $N = 1121$.

TABLE 3
Studies 2, 3, 4, and 6: Comparison of alternative factor structures for items of the affect measure

Model	Content	χ^2,df	$\Delta \chi^2$, Δdf‡	CFI	TLI	RMSEA	SRMR
Model 1	Hypothesised Model with Four factors: Anxiety, Enthusiasm, Depression, and Comfort (HAUA, HAPA, LAUA, LAPA)	S2: 518.94, 98 S3: 858.59, 98 S4: 212.73, 98 S6: 667.35, 98	S2: --- S3: --- S4: --- S6: ---	S2: .93 S3: .95 S4: .94 S6: .94	S2: .95 S3: .94 S4: .93 S6: .93	S2: .08 S3: .07 S4: .07 S6: .07	S2: .06 S3: .06 S4: .07 S6: .07
Model 2	Two factors: Pleasant Affect (HAPA + LAPA) and Unpleasant Affect (HAUA + LAUA)	S2: 1373.02, 103 S3: 3160.63, 103 S4: 624.25, 103 S6: 2012.51, 103	S2: 854.08, 5* S3: 2302.04, 5* S4: 411.52, 5* S6: 1345.16, 5*	S2: .79 S3: .79 S4: .72 S6: .80	S2: .77 S3: .76 S4: .67 S6: .77	S2: .13 S3: .13 S4: .15 S6: .13	S2: .09 S3: .10 S4: .12 S6: .10
Model 3	Two factors: Anxiety to Comfort (HAUA + LAPA) and Depression to Enthusiasm (LAUA + HAPA)	S2: 2553.30, 103 S3: 6305.57, 103 S4: 724.28, 103 S6: 3338.93, 103	S2: 2034.36, 5* S3: 5446.98, 5* S4: 511.55, 5* S6: 2671.58, 5*	S2: .60 S3: .58 S4: .67 S6: .65	S2: .78 S3: .51 S4: .61 S6: .58	S2:.18 S3: .19 S4: .16 S6: .17	S2: .16 S3: .16 S4: .15 S6: .12
Model 4	Two factors: High Activation Affect (HAUA + HAPA) and Low Activation Affect (LAUA + LAPA)	S2: 2729.77, 103 S3: 6632.17, 103 S4: 887.49, 103 S6: 3769.72, 103	S2: 2210.83, 5* S3: 5773.58, 5* S4: 674.76, 5* S6: 3102.37, 5*	S2: .57 S3: .55 S4: .58 S6: .61	S2: .50 S3: .48 S4: .51 S6: .52	S2: .19 S3: .20 S4: .18 S6: .18	S2: .19 S3: .22 S4: .19 S6: .13
Model 5	Baseline Model with One factor: Total Affect (HAUA+HAPA+LAUA+LAPA)	S2: 3008.57, 104 S3: 7296.85, 104 S4: 990.81, 104 S6: 3795.54, 104	S2: 2489.63, 6* S3: 6438.26, 6* S4: 778.08, 6* S6: 3128.19, 6*	S2: .53 S3: .51 S4: .52 S6: .61	S2: .72 S3: .43 S4: .45 S6: .64	S2: .20 S3: .21 S4: .20 S6: .18	S2: .14 S3: .17 S4: .15 S6: .13

Notes. S2, S3, S4, S6 = Findings for, respectively, Studies 2, 3, 4 and 6. N = 713 (S2), 1646 (S3), 225 (S4), 1121 (S6); χ^2 = chi-square value; df = degrees of freedom; * model fit significantly worse at $p < .05$ level; ‡change in model fit assessed in relation to hypothesised Model 1; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root-mean-square error of approximation; SRMR = standardized root-mean-square residual; HAPA = High-activation pleasant affect; HAUA = High-activation unpleasant affect; LAPA = Low-activation pleasant affect; LAUA = Low-activation unpleasant affect.

TABLE 4
Study 1: Structural equation model of affect quadrants and work behaviours

Model	Description	χ^2, df	$\Delta\chi^2$, Δdf↕	RMSEA	SRMR	CFI	TLI
Model 1	Hypothesized: Freely estimated model	12.51, 6	---	.08	.06	.97	.90
Model 2	Constraining paths between all pleasant affects and positive behaviours to be equal	30.10, 8	17.59, 2*	.13	.07	.89	.76

Notes. N = 166; χ^2 = chi-square value; df = degrees of freedom; * model fit significantly worse at $p < .05$ level; ↕change in model fit assessed in relation to hypothesised Model 1; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root-mean-square error of approximation; SRMR = standardized root-mean-square residual.

TABLE 5
Study 2: Structural equation model of affect quadrants and work behaviours

Model	Description	χ^2, df	$\Delta\chi^2$, Δdf↕	RMSEA	SRMR	CFI	TLI
Model 1	Hypothesized: Freely estimated model	959.66, 320	---	.05	.06	.93	.92
Model 2	Constraining paths between all pleasant affects and positive behaviours to be equal	1001.26, 323	41.60, 3*	.06	.06	. 93	.92

Notes. N = 678; χ^2 = chi-square value; df = degrees of freedom; * model fit significantly worse at $p < .05$ level; ↕change in model fit assessed in relation to hypothesised Model 1; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root-mean-square error of approximation; SRMR = standardized root-mean-square residual.

TABLE 6
Study 3: Structural equation model of affect quadrants and work behaviours

Model	Description	χ^2, df	$\Delta\chi^2$, Δdf‡	RMSEA	SRMR	CFI	TLI
Model 1	Hypothesized: Freely estimated model	2026.69, 394	---	.05	.05	.94	.93
Model 2	Constraining paths between all pleasant affects and positive behaviours to be equal	2117.51, 398	90.82, 4*	.05	.05	.93	.92
Model 3	Constraining paths between activated pleasant affect and positive behaviours to be equal	2080.39, 397	53.70, 3*	.05	.05	.94	.93

Notes. $N = 1577$; χ^2 = chi-square value; df = degrees of freedom; * model fit significantly worse at $p < .05$ level; ‡change in model fit assessed in relation to hypothesised Model 1; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root-mean-square error of approximation; SRMR = standardized root-mean-square residual.

TABLE 7
Study 4: Structural equation model of affect quadrants and work behaviours

Model	Description	χ^2, df	$\Delta\chi^2$, Δdf‡	RMSEA	SRMR	CFI	TLI
Model 1	Hypothesized: Freely estimated model	21.40, 8	---	.09	.03	.98	.87
Model 2	Constraining paths between all pleasant affects and positive behaviours to be equal	39.75, 13	18.35, 5*	.10	.04	.96	.84
Model 3	Constraining paths between activated pleasant affect and positive behaviours to be equal	40.29, 12	18.89, 4*	.10	.05	.96	.82

Notes. $N = 225$; χ^2 = chi-square value; df = degrees of freedom; * model fit significantly worse at $p < .05$ level; ‡change in model fit assessed in relation to hypothesised Model 1; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root-mean-square error of approximation; SRMR = standardized root-mean-square residual.

TABLE 8
Study 5: Structural equation model of affect quadrants and work behaviours

Model	Description	χ^2, df	$\Delta\chi^2$, Δdf↕	RMSEA	SRMR	CFI	TLI
Model 1	Hypothesized: Freely estimated model	7.69, 8	---	.00	.03	.99	.99
Model 2	Constraining paths between all pleasant affects and positive behaviours to be equal	15.10, 11	7.41, 3[+]	.05	.04	.99	.96
Model 3	Constraining paths between activated pleasant affect and positive behaviours to be equal	8.12, 10	0.43, 2	.00	.03	.99	.99

Notes. $N = 162$; χ^2 = chi-square value; df = degrees of freedom; [+] model fit significantly worse at $p < .10$ level; ↕change in model fit assessed in relation to hypothesised Model 1; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root-mean-square error of approximation; SRMR = standardized root-mean-square residual.

TABLE 9
Study 6: Structural equation model of affect quadrants and work behaviours

Model	Description	χ^2, df	$\Delta\chi^2$, Δdf↕	RMSEA	SRMR	CFI	TLI
Model 1	Hypothesized: Freely estimated model	2334.87, 812	---	.04	.05	.94	.93
Model 2	Constraining paths between all pleasant affects and positive behaviours to be equal	2716.22, 937	381.35, 125*	.04	.05	.94	.93
Model 3	Constraining paths between activated pleasant affect and positive behaviours to be equal	2386.83, 815	51.96, 3*	.04	.05	.94	.93
Model 4	Constraining paths between all unpleasant affects and negative behaviours to be equal	2677.12, 936	342.25, 124*	.04	.05	.94	.93

Notes. N = 1091; χ^2 = chi-square value; df = degrees of freedom; * model fit significantly worse at $p < .05$ level; ↕change in model fit assessed in relation to hypothesised Model 1; CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = root-mean-square error of approximation; SRMR = standardized root-mean-square residual.

APPENDIX 1

Multi-study descriptive overview: Work behaviours as a function of four types of single-quadrant affect

Behaviour type	Mean adjusted R-squared	Single-study four-quadrant regressions: Number of significant coefficients (Mean bivariate r in brackets)			
		Single-quadrant pleasant affects		Single-quadrant unpleasant affects (reverse-scored)	
		High-activation pleasant (HAPA)	Low-activation pleasant (LAPA)	High-activation unpleasant (HAUA)	Low-activation unpleasant (LAUA)
Nine positive behaviours	.19	21*** 1** 1*ns* (.37)	2*** 21*ns* (.18)	1*** 1** 21*ns* (.09)	4*** 2** 17*ns* (.17)
Four negative behaviours	.23	3***neg 1**neg (-.33)	4*ns* (-.16)	4*ns* (-.31)	4***neg (-.45)
Positive and more discretionary: Five proactive behaviours	.13	9*** 1** (.35)	10*ns* (.13)	10*ns* (.02)	10*ns* (.05)
Positive and more discretionary: Three citizenship behaviours	.28	9*** (.51)	9*ns* (.24)	9*ns* (.13)	3*** 2** 4*ns* (.28)
Positive and less discretionary: Proficient behaviour	.13	3*** 1*ns* (.29)	2*** 2*ns* (.16)	1*** 1** 2*ns* (.18)	1*** 3*ns* (.20)

Note. *** $p < .001$, ** $p < .01$, *ns* not significant

APPENDIX 2

Multi-study descriptive overview: Work behaviours as a function of three types of combined-quadrant affect

Behaviour type	Two-quadrant pleasant and unpleasant affects			Two-quadrant diagonal dimensions: HAUA-LAPA and LAUA-HAPA			Four-quadrant affect
	Mean adjusted *R*-squared	Single-study regressions: Number of significant coefficients (Mean bivariate *r* in brackets)		Mean adjusted *R*-squared	Single-study regressions: Number of significant coefficients (Mean bivariate *r* in brackets)		Mean *R*-squared
		Pleasant affect (HAPA and LAPA)	Unpleasant affect (Reversed HAUA and LAUA)		Reversed HAUA and LAPA	Reversed LAUA and HAPA	
Nine positive behaviours	.14	19*** 3** 1*ns* (.35)	5*** 1** 17*ns* (.14)	.15	2*** 21*ns* (.17)	16*** 4** 3*ns* (.35)	.11
Four negative behaviours	.20	4***neg (-.30)	4***neg (-.41)	.21	2***neg 2*ns* (-.27)	4***neg (-.45)	.18
Positive and more discretionary: Five proactive behaviours	.09	8*** 2** (.29)	10*ns* (.04)	.07	10*ns* (.10)	5*** 3** 2*ns* (.26)	.05
Positive and more discretionary: Three citizenship behaviours	.22	9*** (.46)	3*** 1** 5*ns* (.23)	.26	9*ns* (.23)	9*** (.49)	.19
Positive and less discretionary: Proficient behaviour	.11	2*** 1** 1*ns* (.28)	2*** 2*ns* (.20)	.11	2*** 2*ns* (.21)	2*** 1** 1*ns* (.30)	.10

Note. *** $p < .001$, ** $p < .01$, *ns* not significant