

Research Companion to Emotion in Organizations

Edited by

Neal M. Ashkanasy

*Professor of Management, UQ Business School, University of Queensland,
Australia*

and

Cary L. Cooper, CBE

*Pro Vice Chancellor (External Relations) and Distinguished Professor of
Organizational Psychology and Health, Lancaster University, UK*

NEW HORIZONS IN MANAGEMENT

Edward Elgar

Cheltenham, UK • Northampton, MA, USA

NEW HORIZONS IN MANAGEMENT

Series Editor: Cary L. Cooper, CBE, Pro Vice Chancellor (External Relations) and Distinguished Professor of Organizational Psychology and Health, Lancaster University, UK.

This important series makes a significant contribution to the development of management thought. This field has expanded dramatically in recent years and the series provides an invaluable forum for the publication of high quality work in management science, human resource management, organizational behaviour, marketing, management information systems, operations management, business ethics, strategic management and international management.

The main emphasis of the series is on the development and application of new original ideas. International in its approach, it will include some of the best theoretical and empirical work from both well-established researchers and the new generation of scholars.

Titles in the series include:

Managing Emotions in Mergers and Acquisitions

Verena Kusstatscher and Cary L. Cooper

Employment of Women in Chinese Cultures

Half the Sky

Cherlyn Granrose

Competing Values Leadership

Creating Value in Organizations

Kim S. Cameron, Robert E. Quinn, Jeff DeGraff and Anjan V. Thakor

Research Companion to Working Time and Work Addiction

Edited by Ronald J. Burke

Happy-Performing Managers

The Impact of Affective Wellbeing and Intrinsic Job Satisfaction in the Workplace

Peter J. Hsieh, Peter P. Sevastos and Cary L. Cooper

Women in Leadership and Management

Edited by Duncan McTavish and Karen Miller

Appreciative Inquiry and Knowledge Management

A Social Constructionist Perspective

Tojo Thatchenkery and Dilpreet Chowdhry

Research Companion to the Dysfunctional Workplace

Management Challenges and Symptoms

Edited by Janice Langan-Fox, Cary L. Cooper and Richard J. Klimoski

Research Companion to Emotion in Organizations

Edited by Neal M. Ashkanasy and Cary L. Cooper

International Terrorism and Threats to Security

Managerial and Organizational Challenges

Edited by Ronald J. Burke and Cary L. Cooper

Women on Corporate Boards of Directors

International Research and Practice

Edited by Susan Vinnicombe, Val Singh, Ronald J. Burke, Diana Bilimoria and Morten Huse

Handbook of Managerial Behavior and Occupational Health

Edited by Alexander-Stamatios G. Antoniou, Cary L. Cooper, George P. Chrousos, Charles D. Spielberger and Michael William Eysenck

1 The structure of affect: history, theory, and implications for emotion research in organizations

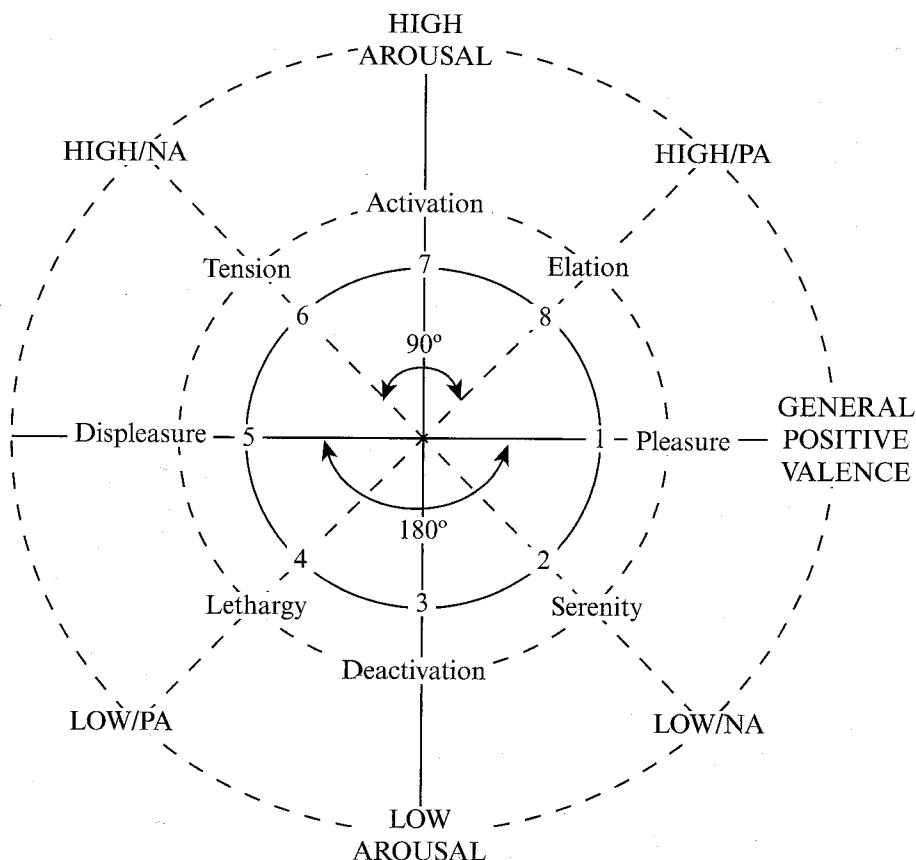
Myeong-Gu Seo, Lisa Feldman Barrett and Sirkwoo Jin

Introduction

At the dawn of the 21st century, emotion has emerged as a central topic of scientific inquiry about the human condition. Fields with broadly differing epistemological frameworks (e.g., cultural anthropology, philosophy, social psychology, cognitive science, and cognitive and behavioral neuroscience) all study something called 'emotion'. This proliferation of scientific inquiry on the nature of emotion has spilled over into the field of organizational behavior, witnessing an unprecedented and accelerated increase in interest in various aspects of emotions in organization over the past decades (e.g., Ashkanasy et al., 2000; Fineman, 2000; Fisher & Ashkanasy, 2000; Brief & Weiss, 2002). Nevertheless, the problem of how to understand the structure of human affective experience has remained unresolved (see, Cropanzano et al., 2003). Questions of structure are fundamental to the question of what emotions are and how they should be defined, because structure indicates the basic building blocks of emotional life that supports an inductive science of emotion. To the extent that affective experiences can be reliably assessed and understood, they can be incorporated into our theorizing and research on all the topics that interest us as scholars.

Since the time of Wundt (1924), researchers have relied on dimensional models of affect to ground the scientific investigation of emotion. Dimensional models assume that emotions such as anger, sadness, fear and so on, share a common set of more basic psychological properties that are defined by two dimensions. Various dimensional models of affect have been proposed (e.g., Russell, 1980; Watson & Tellegen, 1985; Thayer, 1989; Larsen & Diener, 1992; Cacioppo et al., 1999; Reich et al., 2003), but most of the research to date has focused on two: the valence/arousal dimensions associated with the circumplex model of affect (Russell, 1980; Barrett & Russell, 1998; Remington et al., 2000; for a review, see Russell & Barrett, 1999) and the negative activation (NA)/positive activation (PA) dimensions associated with a simple structure model of affect (Watson & Tellegen, 1985; Tellegen et al., 1999; for a review, see Watson et al., 1999). A schematic representation of the affective space with both dimension sets is presented in Figure 1.1.

Both the valence/arousal and the NA/PA models appear in subdisciplines of the psychological literature, have considerable support for their validity, and agree that discrete emotions share more fundamental psychological properties, but each reflects a different theory about the important descriptive properties and causal processes associated with emotion. In the last several years, there has been much debate over which model is more fundamental (Larsen & Diener, 1992; Parkinson et al., 1996; Barrett & Russell, 1998; Cacioppo et al., 1999; Russell & Barrett, 1999; Watson et al., 1999), with little in the way of a resolution. Resolving this debate is crucial if our knowledge about affective



Source: Barrett and Russell (1998). © American Psychological Association.

Figure 1.1 Schematic representation of affective space

phenomena is to develop and move forward. Before a complete resolution emerges, however, scholars in various disciplines including organizational behavior are constantly facing a challenging question of how to understand and use these alternative models of affective structure to best investigate the particular affective phenomena of interest and also how to best advance the scientific understanding of affective experience in the field as a whole.

The purpose of this chapter is to provide some answers to this question with respect to its relevance for research on emotion in organizations. This chapter consists of three sections. First, we provide the historical and theoretical background of the valence/arousal and NA/PA models. Second, we review the literature on emotion in organizations. In particular, we critically examine how organizational scholars have used the two models of affective structure in conceptualizing, measuring and analyzing affective experience in organization. Finally, we discuss implications for future research directions.

Two models of affect structure: history and theory

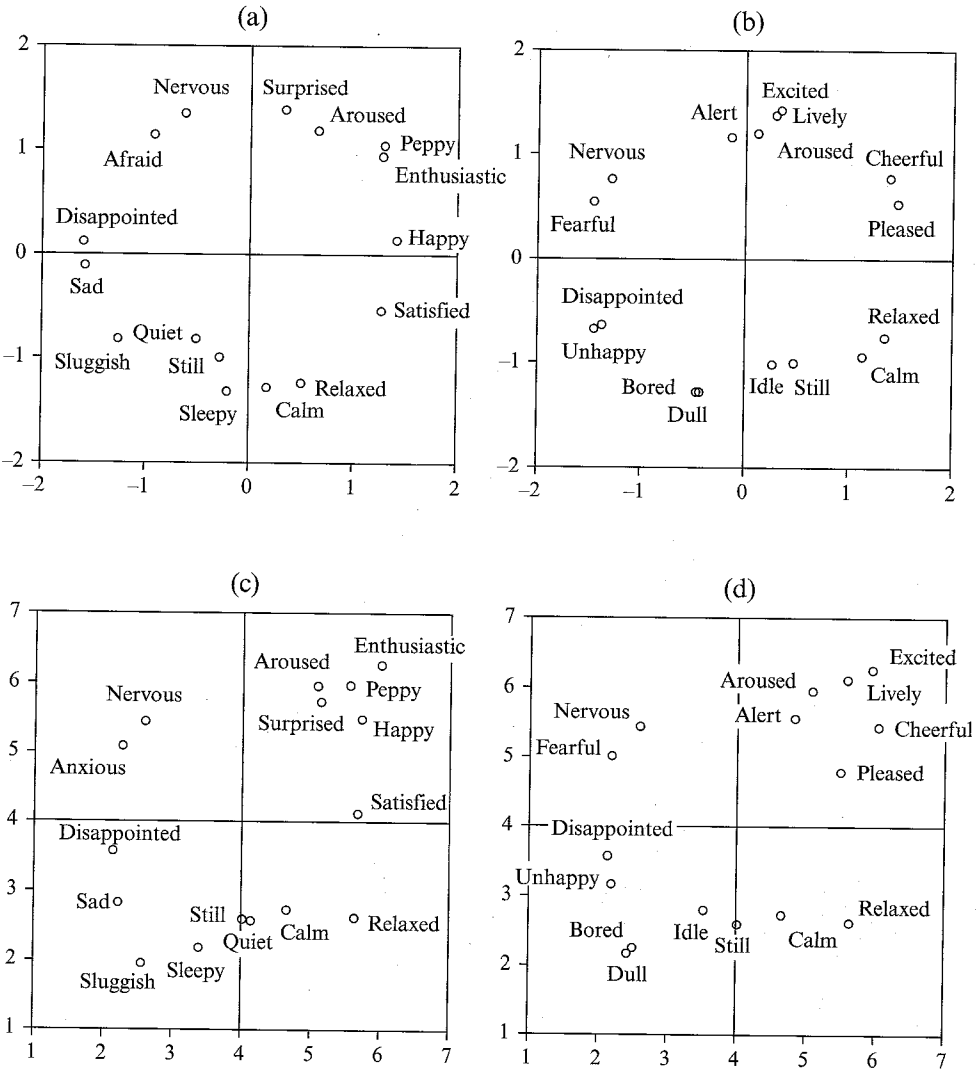
The valence/arousal circumplex model of affect

The circumplex model focuses on two dimensions of affective phenomena: valence and arousal (Russell, 1980; Barrett & Russell, 1998; Russell & Barrett, 1999). Valence refers to the hedonic quality (pleasure or displeasure) associated with affective phenomena. Arousal (or activation) refers to felt activation associated with affective phenomena. All affective stimuli (i.e., emotions such as anger, sadness and fear, as well as non-emotional affective states like fatigue, sleepiness and placidity) can be defined as combinations of these two independent dimensions. Empirical representations of the affective circumplex are presented in Figure 1.2.

The valence/arousal model has a long history in psychology. It has theoretical roots in work by Wundt (1912 [1924]), who attempted to classify affective experiences along three dimensions (i.e., pleasant–unpleasant, calm–excited, relaxation–tension), in work by Woodworth (1938), who similarly attempted to classify facial expressions of emotions, and in work by Schlosberg (1941, 1952, 1954), who proposed a circular structure of emotion defined by a similar three dimensions (i.e., pleasantness–unpleasantness, attention–rejection and sleep–tension). It is also consistent with the semantic differential work by Osgood (Osgood et al., 1957), who demonstrated that there are three major components of meaning in natural language (evaluation, activity and potency). Russell (1980) consolidated and elaborated on this earlier work with the notion that the circular structure of emotion was actually a circumplex.

The valence/arousal circumplex model is highly robust and has been identified for a range of affective stimuli. Valence/arousal structures have been found in judgments of emotion language. Circumplex structures have been reliably derived from similarity ratings for different sets of affect terms (Block, 1957; Bush, 1973; Russell, 1980; Feldman, 1995a; Barrett & Fossum, 2001; Barrett, 2004) that index emotion language in many cultures (Russell, 1983, 1991; for a review, see Russell, 1991). Circumplex structures have been identified in perceptions of facially expressed emotion (e.g., Schlosberg, 1952, 1954; Abelson & Sermat, 1962; Shepard, 1962; Cliff & Young, 1968; Fillenbaum & Rapaport, 1971; Dittmann, 1972; Green & Cliff, 1975; Russell et al., 1989a) in participants of different ages (Russell & Ridgeway, 1983; Russell & Bullock, 1985). Circumplex structures have been established in self-reports of affective states (Russell, 1978, 1980; Russell & Steiger, 1982; Reisenzein, 1994; Feldman, 1995a, 1995b; Barrett, 1998, 2004; Barrett & Russell, 1998).

In general terms, a circumplex structure is a multi-purpose, mathematical formalism for representing the mental structure of a group of stimuli through the geometry of the circle (Guttman, 1957). A circumplex lacks simple structure, such that items or stimuli are distributed around the two dimensions and fail to cluster together in particular parts of the affective space. A circumplex is usually roughly circular in shape with elements equally spaced from one another, but neither of these features is necessary for a structure to be circumplex. When ratings of items or objects produce a circumplex configuration, it indicates that the items are heterogeneous (made up of multiple components) and can be distinguished from one another (for a recent discussion, see Barrett, 2004). Evidence suggests that although the valence/arousal model can exist independently of a circumplex formation (e.g., Reisenzein, 1994; Lang et al., 1998), emotion-related items usually conform to



Note: Valence is the horizontal axis and arousal is the vertical axis.

Sources: (a) was derived from similarity ratings taken from Feldman (1995a). (b) was derived from similarity ratings taken from participants in Barrett and Fossum (2001). (Both figures appear in Barrett and Fossum, 2001.) (c) and (d) were derived from direct semantic ratings.

Figure 1.2 Empirical representations of the valence/arousal model

a circumplex configuration when the theoretically defined space is sampled in a representative way (Yik et al., 1999; Remington et al., 2000).

The circumplex, as Guttman (1957) conceived it, was defined solely in terms of ordinal relationships and so, alone, does not allow a quantitative analysis of the properties that

the items or objects share – it merely depicts their nonparametric relatedness in geometric space. To understand what properties are being represented, it is necessary to embed the circumplex within a Euclidean space of two dimensions (Shepard, 1978). The dimensions represent the salient psychological attributes or features that ground the mental structure of those items or objects (Davison, 1983). On this view, then, valence and arousal dimensions represent core features of affective representations.

When derived from similarity ratings of emotion-related language or of facially expressed emotion, the circumplex dimensions represent conceptual knowledge contained in emotion-related concepts.¹ Specifically, valence and arousal represent the core affective features of pleasure/displeasure and activation/deactivation that define both non-emotional affective concepts such as fatigue, sleepiness and placidity, and emotion concepts such as anger, sadness and fear. The valence and arousal dimensions represent necessary, but not sufficient, semantic components of emotion concepts. Emotion terms and their related facial expressions array along valence and arousal dimensions because these two properties represent basic elements of emotion concepts. In addition to these basic semantic components, emotion representations contain other elements of emotion knowledge that differentiate discrete emotions such as fear, anger and sadness. According to this view, the valence/arousal circumplex is like a very primitive representation or cognitive map of affective space. This cognitive map, anchored by the valence and arousal dimensions, is virtually always recovered in multidimensional scaling analyses of similarity ratings of affective stimuli.

When derived from correlations between self-reported affective states, circumplex dimensions represent core affective feelings: the most elementary consciously accessible affective feelings of pleasure versus displeasure, or activation versus sleep (as well as their neurophysiological counterpart; Russell & Barrett, 1999; Barrett, 2006), either as they apply to non-emotional affective states such as fatigue, sleepiness and placidity or to emotional episodes such as anger, sadness and fear. Emotional episodes (that is, short-lived emotional responses that are inherently tied to an object) contain core affective feelings of valence and arousal because these two properties represent elemental components of phenomenal affective experience. In addition to these basic phenomenal components, emotional episodes contain other elements that distinguish them from one another (the typical object, behavior, relational theme associated with each emotion) (Russell & Barrett, 1999; Russell, 2003; Barrett, 2006). In this view, the valence/arousal circumplex is a very basic map of the descriptive or phenomenal features of felt experience. Idiographic studies of the circumplex model have demonstrated individual variability in the importance of the two dimensions for emotional experience (Feldman, 1995b; Barrett, 1998, 2004).

Recent formulations of the circumplex model have discussed the biological underpinnings the circumplex model of affect (Barrett, 2006; Barrett et al., 2007; Duncan & Barrett, in press). Valence and arousal are psychological properties that are thought to derive from a constant stream of transient alterations in an organism's neurophysiological and somatovisceral state that represent its immediate relationship to the flow of changing events (Russell & Barrett, 1999; Russell, 2003; Barrett, 2006); in a sense, they are a neurophysiologic barometer of the individual's relationship to an environment at a given point in time. To the extent that an object or event changes a person's 'internal milieu', it can be said to have affective meaning – these changes are what we mean when we say that

a person has an affective reaction to an object or stimulus. They are the means by which information about the external world is translated into an internal code or representation (Nauta, 1971; Damasio, 1999; Ongur & Price, 2000). If core affect is a neurophysiologic barometer that sums up the individual's relationship to the environment at a given point in time, then self-reported feelings are the barometer readings. Feelings of core affect provide a common metric for comparing qualitatively different events (Cabanac, 2002).

The neural circuitry that establishes valence and arousal is designed to translate sensory information from the external environment into an internal, meaningful representation that can be used to safely navigate the world. A widely distributed circuitry accomplishes this function, by binding sensory and somatovisceral information to create a valenced, mental representation of external objects (e.g., facial expressions, foods, etc.). The function of this circuitry is to link sensory information about a stimulus with a representation of how the stimulus affects the person's internal (somatovisceral) state (Ongur & Price, 2000; Ghashghaei & Barbas, 2002; Barbas et al., 2003; Ongur et al., 2003; Kringelbach & Rolls, 2004). This circuitry involves areas of the brain that are traditionally considered to be 'affective' (e.g., amygdala and ventral striatum), along with anterior portions of the cortex that have traditionally been considered cognitive (e.g., orbitofrontal cortex ventromedial prefrontal cortex, and anterior cingulate cortex). These anterior cortical areas do not appear to simply regulate the amygdala, but rather appear integral to computing the value of an object and guiding visceral and motor responses accordingly. By virtue of its broad, distributed connectivity, this circuitry modulates sensory processes both directly (via direct projections to the sensory cortex) and indirectly (via projections to the thalamus and brainstem). Through this modulation, this core affective system plays a crucial role in all levels of cognitive processing, determining what we are conscious of, how we use and understand language, and what content is encoded and retrieved in memory (for a discussion, see Duncan & Barrett, *in press*).

The NA/PA affect model

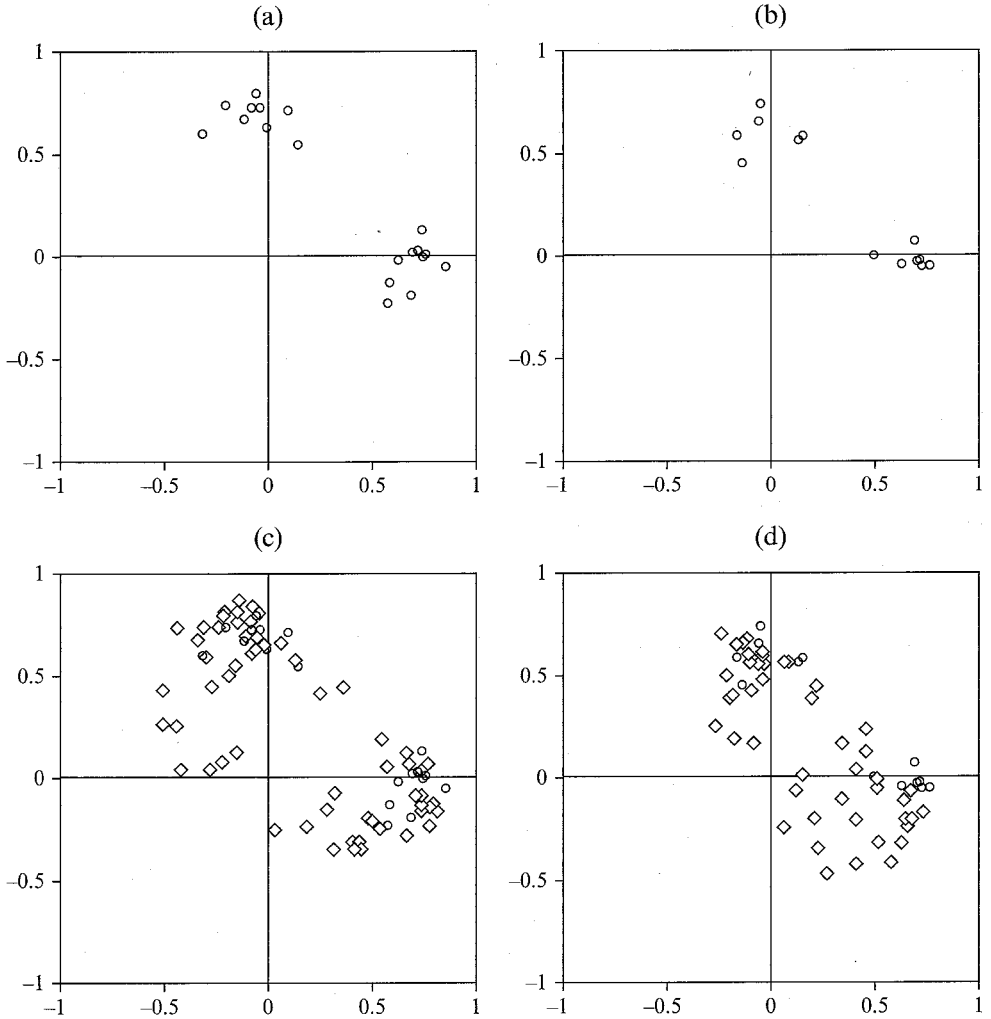
Although the valence/arousal model of affect has a long history in the psychological literature, the negative activation and positive activation model is currently dominant for measuring affective experience across most subdisciplines of psychology. Originally called 'negative affect' and 'positive affect', NA and PA dimensions recently underwent a name change (Watson et al., 1999) to avoid conceptual confusions that were rampant in the psychological literature (for a discussion, see Barrett & Russell, 1998). NA and PA dimensions are typically derived by orthogonally rotating the valence and arousal dimensions to simple structure using the varimax criterion (e.g., Zevon & Tellegen, 1982; Watson et al., 1984; Watson & Tellegen, 1985), although oblique rotations give similar results (Watson, 1988b). A varimax rotation orients factors toward large clusters of variables, thereby trying to come as close as possible to a simple structure solution (i.e., items load on one factor but not on the other). As a result, the NA/PA model has affect terms clustering together in particular portions of the affective space in a way that is more consistent with a simple structure than with a circumplex configuration (Watson & Tellegen, 1985, p. 221). Unlike the valence/arousal circumplex model which has been identified in an array of affective stimuli, solely the NA/PA model has been identified in analyses of self-report ratings of mood (e.g., Watson & Tellegen, 1985; Watson, 1988a; Meyer & Shack, 1989; Watson & Clark, 1997).

Although they can be thought of as rotational variants in cross-sectional analyses of self-reported affect, the NA and PA dimensions are conceptually distinct from valence and arousal. Whereas valence and arousal are each bipolar, NA and PA are defined as 'descriptively bipolar, but affectively unipolar' dimensions of affective experience (Zevon & Tellegen, 1982; Watson & Tellegen, 1985). Descriptively, the NA dimension is anchored by a cluster of negatively valenced, high-arousal emotions on one end (e.g., nervous, angry), and by positively valenced, low-arousal emotions on the other (e.g., calm, relaxed). Similarly, the PA dimension is anchored by a cluster of positively valenced, high-arousal emotions on one end (e.g., enthusiastic, excited), and by negatively valenced, low-arousal emotions on the other (e.g., tired, bored). NA and PA dimensions are thought to be affectively unipolar, however, in that the low-arousal ends of each dimension are meant to refer to the absence of affective feeling (Zevon & Tellegen, 1982). As a result, the self-report measure built to assess measure NA and PA dimensions (Positive and Negative Affect Schedule), captures only high-end dimension markers (i.e., octants 6 and 8 in Figure 1.1) (Watson et al., 1988).

The PANAS scales can be thought of as defining the descriptive aspects of the model: the NA dimension represents the experience of negative high activation, affects such as nervousness, guilt and anger, whereas the PA dimension represents the experience of positive high activation, affect such as excitement or enthusiasm (Watson & Clark, 1997). Empirical representations of the NA/PA model are presented in Figure 1.3. All four graphs were derived from exploratory factor analyses of self-report ratings taken from two samples of undergraduate students at Penn State University. Figures 1.3a and b represent analyses of anchors taken from the high NA and high PA octants of affective space (octants 6 and 8); Figure 1.3a represents the analysis of PANAS items, and Figure 1.3b represents the analysis of items selected from Larsen & Diener (1992). Figures 1.3c and d represent the NA/PA model derived from exploratory factor analyses of those same self-report samples using all octants of the affective space.

The NA/PA model of affect has been linked to five different literatures, each of which is related to the theoretical underpinnings of the model. First, NA and PA dimensions have a history in empirical evidence suggesting that positive and negative affects are independent (e.g., Bradburn, 1969; Zevon & Tellegen, 1982; Warr et al., 1983; Diener & Emmons, 1984).² Recent evidence suggests that NA and PA dimensions appear uncorrelated because of measurement error (Russell & Carroll, 1999). Once measurement error is corrected, the two dimensions are moderately negatively correlated (latent correlation around -0.54 ; Green et al., 1993; Barrett & Russell, 1998).

Second, the NA/PA model of affect also has its roots firmly in personality theory (Tellegen, 1985; Watson et al., 1988). NA and PA dimensions are thought to reflect 'real, universal, and fundamentally different processes' (Watson & Tellegen, 1985, p. 232) that are linked to the affective components of extraversion and neuroticism (McCrae & Costa, 1991; Watson & Clark, 1992), as well as to biobehavioral systems that mediate goal-directed approach and avoidance systems more generally (Tellegen, 1985; Carver & White, 1994; Watson et al., 1999). According to Watson & Tellegen, 1985; Tellegen, 1985; Watson, 1988a, 1988b), NA and PA dimensions represent individual differences in the susceptibility to certain affective states (also see Watson & Clark, 1984, 1992; Meyer & Shack, 1989; Watson et al., 1992; Carver & White, 1994). NA is defined as a sensitivity to negative or punishment cues in the environment and is associated with a pervasive predisposition to



Key:

- Adjectives from octants 6 and 8.
- ◇ Adjectives from entire affect space.

Note: PA is the horizontal axis and NA is the vertical axis.

Figure 1.3 *Empirical representations of the NA/PA model*

experience negative emotions; those who experience high levels of one negative affect (e.g., anger) are likely to experience others (e.g., fear). PA is defined as a sensitivity to positive or pleasure cues in the environment and is associated with a predisposition to experience positive emotions, a general sense of well-being and competence, and effective interpersonal

engagement; those who experience one positive affect (e.g., joy) are likely to experience others (e.g., excitement or enthusiasm). It is these sensitivities that are thought to produce the NA/PA structure in self-reports of affect.

Third, the two dimensions have also been referred to as different types or systems of subjective energy (Thayer, 1989). PA has been interpreted as the tendency to experience energetic arousal, whereas NA has been interpreted as the tendency to experience tense arousal (ibid.).

Most recently, the NA/PA model of affect has been linked to the literature on evaluative processing that stems from attitudes research (Cacioppo & Berntson, 1994; Cacioppo et al., 1997, 1999). According to the evaluative space model, computations of the affective significance of a stimulus (i.e., evaluative processing) are derived from combining two independent processes associated with appetitive and aversive (or positive and negative) motivational systems. Based on this view, evaluative space is bivariate, such that the net response of an individual, either toward or away from the stimulus, can be derived from configuring aversive and appetitive motivational systems in a reciprocal fashion (one system activated, the other deactivated), an uncoupled fashion (activation of only one system), or coactive fashion (both systems activated) to produce an affective response to the stimulus. The evaluative space model has been linked to the NA/PA model of affect in part because NA and PA have been previously defined as the subjective components of more general approach and avoidance motivational systems as noted above. Moreover, the apparent independence of NA and PA dimensions based on observed (but not latent) correlations between NA and PA scales has been taken as evidence for the evaluative space model (Cacioppo et al., 1997, 1999).

Finally, review articles on the bivalent structure of affect (e.g., Cacioppo et al., 1997, 1999; Reich et al., 2003) typically cite three lines of evidence to support a parallel processing model of positive and negative information: pharmacological dissociations (dopamine mediating positive affect and serotonin mediating negative effect), architectural separability in subcortical regions (the nucleus accumbens implementing positive affect and the amygdala implementing negative affect), and hemispheric specificity of processing systems from which affect derives (left hemisphere more important for positive affect, and the right hemisphere more important for negative affect). A close inspection of the existing evidence shows that the three lines of evidence cited in support of bivalence are far from conclusive, and these dissociations may be more apparent than real (Duncan et al., 2005).

Congruence, differences and research implications for organizational scholars

To date, the valence/arousal and NA/PA models have been treated as alternative, nomothetic models of affective experience. They are thought to apply equally to all participants in a particular sample, and to all people in the population that was sampled. Both have enjoyed substantial replicability in cross-sectionally measured samples. When a group of individuals report on their affective state at one point in time (be it their momentary experience or some aggregate of their experiences for a given period), the two models are entirely congruous. As rotational variants of one another in exploratory factor analyses of self-reported affect, neither set of dimensions accounts for more variance in affect ratings than the other (on average, they account for about 40–70% of the variance). As long as the entire affective space is adequately measured, either set of axes

can be converted through simple calculation to the other (thereby demonstrating that one set of dimensions correlated to external criteria is not evidence of its superior validity). Recent evidence suggests that even when measured separately, the two sets of dimensions are strongly related to one another and can easily be integrated into one affective structure (Barrett & Russell, 1998; Carroll et al., 1999; Yik et al., 1999). Therefore, from a mathematical point of view, the two models are indistinguishable; one can be mathematically derived from the other by rotating the factor structures by 45 degrees in the affective circumplex.

The validity of the affective space, which is supported by both models, as well as the mathematical congruence between them, gives flexibility to the conceptualization and measurement of affect: it is a matter of how to slice the pie. This appears to be good news for organizational scholars for two reasons. First, it is not only completely legitimate but also desirable for organizational scholars to use the core dimensions of either model as theoretically meaningful dimensions of affective experience in organizations. In addition, they can use either model as a guiding framework for determining appropriate measurement strategies. Second, the two models are not entirely different from each other. Due to the mathematical congruence, research findings based on one model are always interpretable from the other model at least in certain degrees. For example, if a study using the PA/NA model found that PA is positively associated with job satisfaction, this result can also be interpreted based on the valence/arousal model that a simultaneous increase in pleasantness and arousal is positively associated with job satisfaction.

From a conceptual perspective, however, a choice of either model involves very different theoretical and practical implications. Cropanzano et al. (2003) explained this problem in detail. For example, let us suppose that one study has found that PA (measured using the PANAS scale) is positively associated with creativity. From the valence/arousal model, this result could be interpreted as, a simultaneous increase in pleasantness and activation (PA) leads to greater creativity. However, it is still unknown whether the increase in creativity came from an increase in pleasantness or arousal unless pleasantness and arousal are explicitly measured and tested. Thus, this result cannot adequately satisfy the theoretical concerns raised by the valence/arousal perspective. Moreover, because the two models are based on distinct theoretical views about the key dimensions of affective experience, the theoretical interpretation of the same result could also differ. Using the same example above, the researchers adopting the PA/NA model may argue that the positive association between PA and creativity is found because both are simultaneously affected by individuals' approach motivation or positive sensitivity. In contrast, others can argue based on the valence/arousal model that this result comes from an individual's simultaneous increase in coping readiness (arousal) and positive evaluation of the current situation (pleasantness).

The differences in the theoretical viewpoints of the two models naturally lead to different practical implications. For example, based on the PA/NA model, which links the PA and NA dimensions to the two independent motivation systems of approach and avoidance, managers need to implement practices that increase employees' positively activated feelings (e.g., excitement and interest) to foster creativity at work, but do not necessarily need to implement practices aiming to reduce negatively activated feelings (e.g., nervousness and anxiety). But if the two systems are in fact related, the prescription based on this model (doing nothing with the NA related feelings) will be wrong. However, from

the valence/arousal perspective, managerial practices aiming to reduce unpleasant feelings may have the same effects on creativity as those practices increasing positive feelings because unpleasant feelings are simply the opposite of the same pleasantness dimension.

In addition, the two models also differ in measurement philosophy. The PA/NA model assumes a simple structure (i.e., items load on one factor but not on the other) and thus utilizes independent sets of affect items (PANAS scale, Watson et al., 1988) to measure the PA and NA dimensions. In contrast, the valence/arousal model assumes a two-dimensional structure, the circumplex, in which the affect items index more than one kind of content at the same time (Guttman, 1957). To be consistent, the valence and arousal dimensions should be measured by sampling the affect items representing all areas of the circumplex and by using those items to build both the valence and arousal dimensions simultaneously (e.g., Feldman, 1995a; Barrett & Russell, 1998; Barrett, 2004).

These fundamental differences in theoretical basis, measurement approach and practical implications of the two alternative models have three important implications not only for scholars in the field of organizational behavior, but also for the field as a whole. First, it is very important for organizational scholars to carefully choose between the alternative models of affective structure, such that the chosen model is consistent with the theoretical and empirical questions of interest and to explain such choices clearly and explicitly. For example, Huy (2002) in his three-year inductive field study of a large firm, explicitly acknowledged the two alternative models, and also clearly explained his choice by suggesting that the PA/NA dimensions capture the four types of affective experiences that employees typically experience and thus managers try to manage (promote and prevent) during radical organizational change: pleasant/high-activated feelings such as enthusiasm and excitement, unpleasant/low-activated feelings such as disappointment and fatigue, unpleasant/high-activated feelings such as fear and anger, and pleasant/low-activated feelings such as being calm and relaxed. Similarly, Barsade (2002) explicitly chose the valence/arousal model in her experimental study of mood contagion in groups by (i) conceptualizing mood contagion as an increase or decrease in group-level pleasantness on one bipolar dimension of pleasure and displeasure, (ii) linking this bipolar dimension of emotional contagion to other bipolar variations in group behaviors such as cooperativeness and group conflict, and (iii) by explicitly considering the role of valence and arousal dimensions when mood contagion is experimentally induced by confederates. It is also important for scholars to choose measurement tools that are consistent with their chosen model. For example, if scholars focus on happiness versus sadness or on tranquility or calmness, they should not use the PANAS scale because it does not measure it.

Second, due to the mathematical association (similarity) between the two models (only a 45 degree difference in rotation), the result of any study that uses only one model is automatically exposed to an untested alternative hypothesis that the use of the other model could produce better results. Therefore, in order to precisely understand affective experience and its processes and outcomes in organizations, it seems desirable for organizational scholars to design studies in a way that explicitly measures and compares both models to each other whenever possible. For example, in two longitudinal studies, Wright and Staw (1999) used measures based on both the pleasantness model and the PA/NA model and found that job performance is significantly related to the former, but not related to the latter.

Finally, from the standpoint of the field of organizational behavior as a whole, it is important to have a fuller understanding of affective experience and its processes and outcomes in organizations. Such understanding can be hindered when organizational scholars are segregated into groups, one group holding one model while the other group adopting the other, and thus the research findings cannot be shared and/or informed across the groups. This problem is what Cropanzano et al. (2003) called, 'the problem of the whole'. The advancement in our understanding of affective experience in organizations can also be limited by 'the problem of the parts', which Cropanzano et al. describe as an issue of omitting potentially important dimensions of affective experience from adequate scholarly investigation when organizational scholars focus dominantly on certain other dimensions of affective experience. Therefore, it seems important for organizational scholars not only to focus on the two alternative models of affective experience in a balanced manner, but also to engage in an active effort to develop an integrative understanding of both models.

The valence/arousal and PA/NA models used in emotion research in organizations

We have reviewed the literature on emotion in organizations to explore how the two alternative models of affective experience have been used among organizational scholars in light of important research implications. In particular, we selected academic articles that focused on affective experience (state affect including emotion, mood, and affect) published in the seven major journals in the area of organizational behavior over the last 10 years (1996–2006): *Administrative Science Quarterly*, *Academy of Management Journal*, *Academy of Management Review*, *Organization Science*, *Journal of Applied Psychology*, *Organizational Behavior and Human Decision Processes*, and *Journal of Organizational Behavior*. We found a total of 63 articles in which the authors deal with state affect or affective experience – moods and emotions – as one of the main constructs. We summarized them in Table 1.1 and discussed the main findings below according to the emerging themes.

Use of dimensional models of affective experience

Among the 63 articles that we reviewed, we found 34 (53.9%) in which the authors used either or both of the dimensional models in their theory or measurement. Among the 34 articles, only 20 articles (58.8%) explicitly used either or both of the two alternative models of affective structure as their theoretical basis to conceptualize affective experience, and among these 20 articles, only four (20%) explicitly considered and used both models. For the other 14 other articles (out of the 34, or 41.1%) in which one of the models was used, the authors used the models only as measurement tools, and in many cases, provided little explanations of their choices. These results clearly suggest that despite the conceptual and empirical validity of the valence/arousal and PA/NA models and their wide use in other fields including psychology, these dimensional models have been used only moderately among organizational scholars, and in many cases, they have been used only in a marginal or implicit fashion.

Although many factors could contribute to this limited use of the dimensional models, one major reason that is also supported by our review is that many organizational scholars have focused on emotional experiences or emotion episodes at work (i.e., intense and less durable feelings identified with specific objects) as opposed to mood states (i.e., diffused and mild feeling states with longer duration that are not typically identified with

particular objects; see Weiss & Cropanzano, 1996; Weiss, 2002), and they tend to understand such emotional experiences as certain discrete forms or categories (e.g., anger, fear, sadness and happiness) rather than as underlying dimensions. Although such discrete experiences of so-called emotions can be understood as a special kind of affective experience, which can be arrayed in specific areas of the affective circumplex (Russell & Barrett, 1999) or can be grouped as first-order factors that are subsumed to the two second-order dimensions of PA and NA (Tellegen et al., 1999), studies focusing on discrete emotional experiences are less concerned about their underlying dimensionality. Based on our review, the majority of the articles (32 out of 63, or 51%) focused on discrete emotional experiences in organizations, and most of them (30 out of 32, or 94%) did not consider the underlying dimensions informed by the two models of affective structure. We found only two exceptions (George & Zhou, 2002; Lee & Allen, 2002) in which the authors investigated the role of discrete emotions while simultaneously considering the higher-order dimensions of PA and NA.

In addition, we found another reason that may explain the limited use of the dimensional models. The majority of the articles (21 out of 39, or 54%) that focused on moods or general affect (other than discrete emotions) did not explicitly consider the dimensions of the two alternative models in conceptualizing moods or affect. A more common conceptualization has been one that distinguishes affective states into positive versus negative moods (also called positive or negative affect) (see, Brief & Weiss, 2002). The popularity of this conceptualization could be partly explained by the fact that the research on emotion in organizations has been strongly influenced by Isen and her colleagues' pioneering work on positive affect (e.g., Isen et al., 1987; see Isen, 2000, for a review) in which mild and pleasant feelings are experimentally induced (e.g., offering a candy bag) and related to other behavioral outcomes (e.g., decision making). The positive-negative mood conceptualization is not necessarily incompatible with the two dimensional models. Instead, positive and negative moods can be fully understood by either the valence/arousal model or the PA/NA model, or more precisely captured by the general dimension of pleasant and unpleasant feelings (since the PA and NA dimensions assume a certain level of arousal). However, few scholars have explicitly explained in their studies how these positive and negative moods are conceptually and empirically related to the two models of affective structure. Instead, positive versus negative mood has continued to serve as a self-sufficient conceptual framework of understanding affective experience for many organizational scholars (see, Brief & Weiss, 2002).

Popularity of the PA/NA model

Based on our review, we found that a total of 34 articles used either or both of the models at least in their theory or in their measurement, and among them, nine used the valence/arousal model (27%), 21 used the PA/NA model (62%), and four used both models (12%). From the measurement standpoint, nine articles used the scales based on the valence/arousal model (30%), 18 (57%) used the PANAS scale or somewhat equivalent scales (e.g., Job Affect Scale), and four (13%) used multiple scales based on both models. These results suggest that the PA/NA model has been used about twice as much as the valence/arousal model among organizational scholars.

The dominant use of the PA/NA model among organizational scholars can be attributed to a number of reasons. First, from a measurement standpoint, the PANAS scale fits

Table 1.1 Summary of literature review results according to affect construct, theory, measure and research area

Article	Affect construct	Affect theory	Affect measure	Research area
Au et al. (2003)	Mood	Valence/arousal Positive and negative mood	Induced but checked by PL/AT (affect grid)	Decision making
Barsade (2002)	Mood contagion	PL/AT (emotional valence/ emotional energy) PL/AT	Induced & checked by pleasantness Both PL/AT & PA/NA	Group affect & mood contagion Group affect & mood contagion Decision making
Bartel & Saavedra (2000)	Work group moods			
Elsbach & Barr (1999)	Mood	Pleasantness with moderate activation	PL/UP activated moderately	
Fisher (2000)	Mood & emotions	Distinguished emotion versus mood/the model is undefined	Pleasantness & PANAS (JES)	Job satisfaction
Fong (2006)	Emotional ambivalence	Emotional ambivalence – neither PL/AT	Conceptual paper	Creativity Motivation
Seo et al. (2004)	Affective experience	Not clearly defined	PL/AT (happy–unhappy)	Group affect & performance
Totterdell (2000)	Mood (self & teammates)			Job satisfaction
Weiss et al. (1999a)	Mood	PL/AT	PL/AT (CMR)	
Anderson & Thompson (2004)	Positive affect	PA/NA Undefined – only distinguished between mood & emotions	Trait PANAS	Negotiation
Brockner & Higgins (2001)	Emotions at work	PANAS	Conceptual paper	Motivation
Eisenberger et al. (2001)	Positive mood	Positive mood	PANAS (energetic & cheerful)	Motivation
Erez & Isen (2002)	Positive affect	Undefined	Induced & checked by PANAS	Motivation
George & Zhou (2002)	Mood	Undefined theoretically	PANAS & discrete emotions	Creativity
Heller & Watson (2005)	Mood	PANAS – explicitly selected but not explained	PANAS	Job satisfaction

	Emotional states	PANA & PL/AT	Inductive	Organizational change
Huy (2002)	Mood	PANAS	PANAS	Job satisfaction
Ilies & Judge (2002)	Positive and negative affect	PANAS	PANAS	Motivation
Ilies & Judge (2005)	State affect (positive & negative mood)	Positive mood & negative mood: not clearly defined	PANAS	Job satisfaction
Judge & Ilies (2004)	Job affect	PANAS & discrete emotions	PANAS & discrete emotion	Performance
Lee & Allen (2002)	Affective states	PANAS – Larsen/clearly explained & chosen	PANAS (JAS)	Mood contagion & leadership
Lewis (2000)	Mood	Undefined	Induced & checked by PA & pleasantness	Creativity
Madjar et al. (2002)	Positive & negative affect	Neither – not clearly defined	PANAS (JAS)	Decision making
Mittal & Ross (1998)	Positive affect	Undefined – positive affect or emotion	PANAS (JAS)	Mood contagion
Pugh (2001)	Positive & negative emotional responses	PANAS	PANAS	Motivation
Rothbard (2001)	Affective states	PL/AT & PANAS	PANAS (JAS)	Motivation
Saavedra & Kwun (2000)	Negative affect	PANAS – emotions	Induced & checked by PANAS	Decision making
Stone & Kadous (1997)	Positive & negative mood (leader & team members)	PANAS – explicit	Induced & checked by PANAS (JAS)	Group affect, leadership & mood contagion
Sy et al. (2005)	Job-related affect	Explicitly adopted both models but used PANAS in hypothesis	PANAS & pleasantness	Social network & mood Contagion
Totterdell et al. (2004)	Negative affect	Negative affect – discrete emotions (coping)	PL/AT (unpleasant)	Decision making
Wong et al. (2006)	State affect	PANAS & PL	PANAS & PL/AT (only for dispositional)	Performance
Wright & Staw (1999)	Anger & compassion & mood	Discrete emotions	Discrete emotion & pleasantness	Negotiation
Allred et al. (1997)	Shame	Discrete emotion	Discrete emotion (shame; newly developed)	Performance
Bagozzi et al. (2003)				

Table 1.1 (continued)

Article	Affect construct	Affect theory	Affect measure	Research area
Barclay et al. (2005)	Inward focused/outward focused emotions	Discrete emotion	Discrete emotion	Justice
Brown et al. (2005)	Negative emotions	Discrete emotion	Discrete emotion (JES)	Performance
Butt et al. (2005)	Discrete emotion	Discrete emotion (valence & agency)	Discrete emotion	Negotiation
Cole et al. (2006)	Positive & negative emotions	Discrete emotion	Discrete emotion (JES) – similar to PANAS	Job attitude
Creyer & Kozup (2003)	Decision task-related affect	Discrete emotion	Positive emotion (joy)	Decision making
De Cremer & Van Hiel (2006)	Positive & negative emotions	Discrete emotion	Discrete emotion (happy, satisfied, angry)	Justice
Fessler et al. (2004)	Anger & disgust	Discrete emotion	Induced & checked by PANAS	Decision making
Fitness (2000)	Anger	Discrete emotion	Inductive	Motivation
Friedman et al. (2004)	Anger	Discrete emotion	Discrete emotion	Negotiation
Judge et al. (2006)	State hostility	Discrete emotion	PANAS	Job satisfaction & deviation
Kiefer (2005)	Negative emotions	Discrete emotion	Discrete	Organizational change
Koehler & Gershoff (2003)	Negative emotions	Discrete emotion	Discrete emotion	Decision making
Kogut & Ritov (2005)	Emotions	Emotional reaction	Sympathy (discrete)	Decision making
Mairlis & Ozcelik (2004)	Emotions	Discrete emotion	Inductive	Decision making
O'Connor & Arnold (2001)	Negative emotions	Discrete emotion	Discrete emotions (anger)	Negotiation
Perrewé & Zellars (1999)	Discrete emotion	Discrete emotion	Conceptual paper	Organizational stress

Pieters & Zeelenberg (2005)	Regret	Discrete emotion	Discrete emotion	Decision making
Raghunathan & Pham (1999)	Sadness & anxiety	Discrete emotion	Discrete emotion	Decision making
Ratner & Herbst (2005)	Negative emotional reactions	Discrete emotion (regret)	Discrete emotion	Decision making
Van Dijk & Zeelenberg (2005)	Regret	Discrete emotion	Discrete emotion	Organizational emotion
Weiss et al. (1999b)	Discrete emotion	Discrete emotion	Discrete emotion	Justice
Zohar et al. (2003)	Emotional reactions to work events	Discrete emotion	PANAS & fatigue	Organizational emotion
Barry & Oliver (1996)	Affect	Undefined	Conceptual paper	Negotiation
Beal et al. (2005)	Affective experience	Positive & negative affect – not clearly defined	Conceptual paper	Performance Training
Brown (2005)	Experienced affect	Not defined – moods & emotions	Discrete emotions (enjoyment)	Motivation
Forgas & George (2001)	Affect	Neither	Conceptual	Organizational stress & job satisfaction
Fuller et al. (2003)	Mood	Neither – only distinguished between moods & emotions	One-item (good)	Group affect & mood contagion
Kelly & Barsade (2001)	Group emotion & mood	Neither – only distinguished between moods & emotions	Conceptual	Decision making
Shiv & Fedorikhin (2002)	Stimulus-based affect	Neither	Indirectly examined	Motivation
Steele-Johnson et al. (2000)	Affect	Neither	Satisfied with performance	

Notes: CMR = Current Mood Report (Larsen and Kasimatis, 1990); JAS = Job Affect Scale (Brief et al., 1988); JES = Job Emotions Scale (Fisher, 2000); PL/AT = pleasantness/activation; PL/UP = pleasantness/unpleasantness; PANAS = pleasant affect(ivity)/negative affect(ivity).

well with the dominant measurement philosophy in our field that generally prefers a simple structure; PA and NA are measured by two independent sets of items, the PANAS scale, 10 items for PA but not for NA and the other 10 items for NA but not for PA. Second, also from a measurement standpoint, the PANAS scale is simple to use and brief (20 items). The availability of a simple, convenient, clean and reliable measure of affective experience could have contributed to the wide adoption of the PA/NA model relative to the valence/arousal model among organizational scholars. The valence/arousal model also has a simple measure, called an affect grid (Russell et al., 1989b), where the subject is asked to place a single mark on a two-dimensional space of pleasure–displeasure and arousal–sleepiness. However, this measure has not been widely used among organizational scholars as evidenced in our review that only one article in our review (Au et al., 2003) used it. This is perhaps due to its unconventional measurement approach, that is, using a one-item scale to measure multiple constructs simultaneously. Third, from a conceptual point of view, the PA/NA model treats the two valenced dimensions of PA and NA as two independent dimensions, which is consistent with the earlier and still popular view among organizational scholars that positive and negative moods are distinctive and mutually independent entities. In addition, positive and negative moods have also been called positive and negative affect, which were terms previously referring to the PA/NA dimensions. As a result, many organizational scholars tend to implicitly associate the positive and negative moods with the PA and NA dimensions or inadvertently accept the PA/NA model by using the PANAS scale to measure positive and negative moods.

In contrast, the bipolar conceptualization of the pleasant and unpleasant feelings in the valence/arousal model, as well as the heterogeneity assumption of affective states, appears to be at odds with the pre-existing conceptual framework of positive versus negative mood and the dominant measurement philosophy in our field. In particular, the measurement philosophy associated with the valence/arousal model seems to have played a more important role in constraining its adoption. Only a few authors (e.g., Weiss et al., 1999a; Bartel & Saavedra, 2000) measured the pleasantness and activation dimensions by considering the two dimensions of these constructs, for example, by sampling the items representing all areas of the affective circumplex. Instead, most others measured only the pleasantness dimension as a simple-structure construct, for example, by using only the affect items that loaded on the pleasantness dimension (pure markers) (e.g., Elsbach & Barr, 1999; Barsade, 2002).

Empirical comparisons of the two models

In the previous subsection, we discussed the importance of designing studies in a way that both dimensional models are explicitly measured and thus the results can be directly comparable to each other. However, only two (Wright & Staw, 1999; Bartel & Saavedra, 2000) out of a total of 56 empirical articles (3.6%) explicitly measured and empirically compared both models.

First, as we briefly explained above, Wright and Staw (1999) conducted two longitudinal studies, directly comparing the two models by examining their relative influence on job satisfaction, and found that the pleasantness dimension is more effective in explaining job satisfaction than the PA/NA dimensions. However, the comparison is still incomplete because they used a trait-based measure to capture the pleasantness dimension but a state-based measure (PANAS) for the PA/NA dimensions.

We found a more complete empirical comparison of the two models in a study of mood contagion within 70 work groups conducted by Bartel and Saavedra (2000). In this study, Bartel and Saavedra not only explicitly sampled the eight distinctive categories of the affective circumplex that represent exactly the four dimensions of the valence/arousal and PA/NA models, but also empirically examined whether mood contagion within groups occurred in each of these eight-dimensional categories. They found that group moods converged for all of the eight dimensions, suggesting that mood contagion in work groups occurs in the entire space of the affective circumplex rather than its specific parts. They also showed that although group moods in all eight dimensions were systematically related to most group environmental factors (such as membership stability and interdependency) only the activated feelings, regardless of their valence, were positively related to mood regulation norms. This indicates that some of these affective dimensions are more or less effective than other dimensions in explaining certain organizational phenomena under investigation. This study is a good example of how a direct comparison of both models allows researchers to generate a comprehensive understanding of affective processes and outcomes without leaving out potentially important dimensions of affective experience.

Summary: problems and concerns

Our review of the past research on affect in organization has revealed three general problems: (i) the problems of the whole, (ii) the problems of the parts, and (iii) the narrowness of research orientation. We describe them below as a summary of our review.

The problems of the whole Our review clearly shows the problem of the whole (Cropanzano et al., 2003). In our view, the study of affect in our field has been highly fragmented in a conceptual sense. Affective experience has been investigated by different groups of organizational scholars who understand the experience in different ways: some understand it as a combination of valence and arousal, some as positive versus negative activation, some as positive moods versus negative moods, and others approach it as discrete emotional experiences. Although substantial progress in research has been made within each of these camps, it has been difficult to integrate the research findings meaningfully across these camps to enhance our understanding of affective processes and outcomes in organizations. So far, only a few studies have attempted to bridge these conceptual boundaries.

The problems of the parts The dominant use of the PA/NA model over the valence/arousal model in our field, when it by no means suggests scientific superiority of this model over the other, raises a concern that is directly related to what Cropanzano et al. (2003) called, 'the problem of the parts' (p. 851). That is, by mostly focusing on the PA and NA dimensions, researchers are more likely to exclude potentially important variables from their investigations, and as a result, affective experience and its processes and outcomes in organizations are suboptimally understood. Moreover, the PANAS scale, the popular measure among organizational scholars, covers only narrow areas in the affective circumplex and thus leaves other broad ranges of feeling states unexamined in most empirical investigations. Those unexamined areas include the entire low-to-moderate activated feeling states such as pleasure, sadness, calmness, peace and fatigue, as well as other

neutrally valenced and activated feeling states in the affective circumplex, such as surprise and arousal. A particularly important omission seems to be the activation or arousal dimension as also echoed by Cropanzano et al. (2003). Based on our review, only four articles (i.e., Weiss et al., 1999a; Bartel & Saavedra, 2000; Barsade, 2002; Seo et al., 2004) explicitly considered the role of the arousal dimension in their conceptual and/or empirical investigations.

The narrowness of research orientation Our review also raises another related concern, also echoed by Brief and Weiss (2002). That is, the theoretical and methodological orientations in a certain domain of research become narrower as researchers choose their theoretical frameworks and/or research methods based more on what is available and/or popular, and less on thoughtful examination of alternative theoretical models, measurement approaches, and which approach is more relevant to the phenomena under investigation. In our review, most of the articles, particularly ones using the popular PANAS scale, did not provide clear explanations for why a certain model is chosen as either their theoretical framework or measurement instrument, or how the theoretical and methodological questions under investigation were better answered by the chosen model. Instead, the implicit logic was something like, 'the model is chosen because it is there'. Brief and Weiss suggested that this lack of theoretical consideration can be attributed to the unique orientation of past research on emotion in organizations, which primarily focused on applying the results and findings in the basic research (e.g., PA enhances creativity) to organizational settings (e.g., so why not PA at work to enhance creativity at work?). As a result, the dimensional models (the PA/NA model in particular) have been mostly used simply as a means to test (e.g., defining and measuring affect-related variables) the certain known effects of affective experience in organizational contexts.

Conclusions and future research directions

Our review of the past 10 years of affect research in organizations clearly points to several problems that need to be addressed for the further advancement of our understanding of affective processes and outcomes in organizations. First, affect research in organizations has been highly fragmented in a conceptual sense (the problem of the whole), some focusing on the PA/NA dimensions, some focusing on the valence/arousal dimensions, some focusing on positive/negative moods, and others focusing on discrete emotion episodes, but few bridging these conceptual boundaries. Second, some affective dimensions have received substantially more scholarly attention while other important affective dimensions have been generally ignored (the problem of the parts). Third, these problems have been further exacerbated by the narrow research orientation of our field when scholars do not broadly consider and/or carefully choose among alternative theoretical models and measurement approaches in investigating affective phenomena in organizations (the narrow research orientation). Here we propose several future research directions to address these problems.

Solving the problem of the whole

To address the problem of the whole, we encourage organizational scholars to actively engage in bridging and/or integrating the fragmented conceptualizations of affective phe-

nomena in organizations by either developing a new integrative conceptual framework or adopting the existing integrative approaches. One promising approach is to use the affective circumplex as an overarching framework to integrate other affect-related concepts including the valence, arousal, PA and NA dimensions as well as positive-negative moods and discrete emotion episodes (e.g., Larsen & Diener, 1992; Barrett & Russell, 1998; Carroll et al., 1999; Russell & Barrett, 1999). In this case, the valence and arousal dimensions become the primary axes that subsume the PA and NA dimensions as well as other discrete emotion episodes. Another useful approach is the hierarchical model developed by Tellegen et al. (1999). In their model, discrete emotional experiences are placed at the bottom as the first-order factors, which constitute the second-order factors of PA and NA at the middle of the hierarchy, which in turn, are subjected to the one bipolar, third-order factor of hedonic tone and/or pleasantness at the top. In this case, the pleasantness dimension of the valence/arousal model still serves as a universal factor integrating the PA and NA dimension, but the activation dimension is subsumed into the PA and NA factors.

Organizational scholars can enhance our integrative understanding of affective processes and outcomes in organizations by using these integrative approaches in their conceptualization of affect-related constructs, in their research design, and in discussing their research findings. We particularly encourage organizational scholars to adopt these integrative approaches in their research design so that multiple models of affective experience can be simultaneously examined and compared. For example, as we explained in detail above, Bartel and Saavedra (2000) sampled the affect items from all areas of the affect circumplex to explicitly build and test both the valence/arousal model and the PA/NA model simultaneously. In another example, Lee and Allen (2002) also measured and compared the relative impact of the PA/NA dimensions and the discrete emotion episodes on work behaviors. Even if such an integrative research design is not feasible, organizational scholars can still contribute to an integrative understanding by explicitly positioning their research and discussing their research implications within these broader integrative frameworks of affective experience.

Solving the problem of the parts

To rectify the problem of the parts, future research needs to directly investigate the relatively less explored parts of the whole. In particular, our review shows that the activation (arousal) dimension has received relatively less theoretical and/or empirical attention but it contains many theoretical implications (e.g., Bartel & Saavedra, 2000; George & Zhou, 2002; Cropanzano et al., 2003). Thus, an important future research direction is to explore the role of the activation (arousal) dimension in affective processes and outcomes in organizations.

Another less explored but also important part seems to be a wide range of low-activated feelings in the affective circumplex, such as calmness, stillness, relaxation, and fatigue, which are not adequately captured by the popular PANAS measure. In particular, according to the recent studies of Tsai et al. (2006), the PA/NA model (high-activated feelings) reflect more a Western view of emotion, whereas Eastern cultures tend to place more value on positive, low-activated feelings (e.g., calmness and tranquility). Research also shows that such positive and low-activated feelings tend to play an important role for the elderly (e.g., Levenson et al., 1994). Therefore, we encourage organizational scholars

to examine the unique roles of these low-activated feelings in organizations in the future, particularly in various cross-cultural studies or studies on aging in organizations.

We believe, however, that a more fundamental solution to this problem of the parts is to design future studies in a way that measures the entire space of the affective circumplex so that all the important dimensions of affective experiences can be recovered and empirically compared to each other.

Broadening research orientations

Future studies also need to broaden the narrow focus and the limited theoretical consideration of the past research on emotion in organizations. To enhance further theoretical development and stimulate broader theoretical discussions across the narrowly defined affect-research boundaries, we encourage the authors of future studies to critically examine and clearly explain their theoretical considerations, particularly regarding: (i) which model of affective structure is adopted, (ii) why it is chosen among alternative models, (iii) how the particular dimensions of affective structure are theoretically related to the organizational phenomenon under investigation, (iv) which measurement approaches are used in relation to the chosen model of affective experience, and (v) how the theoretical implications and results of the study may convey to other alternative models of affective experience.

The problem of narrow orientation also seems to exist in measurement strategies. Most affect-related constructs have been measured based on the assumption that they form a simple structure (and thus only one set of items, called 'pure markers', has been used to measure one construct). Although this assumption directly contradicts the basic idea of an affective circumplex, few studies have adopted a measurement orientation that considers the multi-dimensionality of affective experience. Thus, future studies need to broaden existing measurement orientations by adopting measurement approaches that adequately capture the multi-dimensionality of the affect constructs.

Conclusions

In conclusion, we believe that organizational scholars have enormously advanced our understanding of affective experience and its antecedents and consequences in organizations over the past decades. However, this advancement seems to have occurred mostly within the boundaries of several alternative models of affective experience. We believe that future advancement in our affect research in organizations depends on our collective effort to build an integrative understanding across the boundaries and fill in the missing parts. We hope that this chapter contributes toward such integrative efforts.

Notes

1. The term 'semantic' is used throughout this chapter to refer to a corpus of impersonal, conceptual knowledge about affect-related phenomena that is shared by members of the same culture (Tulving, 1972), as well as semanticized episodic knowledge (Nadal & Moscovitch, 1998) about affect consisting of ensembles of aggregated episodic memories that exist without reference to time and place.
2. Many debates exist in the emotion literature, but none has seemed so intractable as the debate over whether positive and negative affective states are independent or bipolar. This is due, in large part, to the fact that many researchers have treated PA and NA as broadly representative of pleasant and unpleasant (or positive and negative) affect, when instead they represent a specialized type of pleasant and unpleasant affect (i.e., highly activated affective states). Prototypical examples of positive and negative affect that are lower in arousal, such as happiness and sadness, are not indicators of PA and NA, respectively. This tendency to

use NA and PA to represent general pleasant and unpleasant affect has resulted in a number of papers claiming that positive and negative affect in general are independent because NA and PA tend to have a weak zero-order correlation. In fact, when momentary pleasant and unpleasant affects are sampled representatively (i.e., for those states both high and low in arousal), and when measurement error is corrected, the evidence is more consistent with bipolarity (Green et al., 1993; Barrett & Russell, 1998). This stands in contrast to the highly activated pleasant and unpleasant subtypes (i.e., NA and PA) that are moderately negative correlated when measurement error is corrected (ibid.).

References

- Abelson, R.P. and V. Sermat (1962), 'Multidimensional scaling of facial expressions', *Journal of Experimental Psychology*, **63**, 546–54.
- Allred, K.G., J.S. Mallozzi and C.P. Raia (1997), 'The influence of anger and compassion on negotiation performance', *Organizational Behavior and Human Decision Processes*, **70**, 175–87.
- Anderson, C. and L.L. Thompson (2004), 'Affect from the top down: how powerful individuals' positive affect shapes negotiations', *Organizational Behavior and Human Decision Processes*, **95**, 125–39.
- Ashkanasy, N.M., C.E. Härtel and W.J. Zerbe (2000), *Emotions in the Workplace: Research, Theory, and Practice*, Westport, CT: Quorum.
- Au, K., F. Chan, D. Wang and I. Vertinsky (2003), 'Mood in foreign exchange trading: cognitive processes and performance', *Organizational Behavior and Human Decision Processes*, **91**, 322–38.
- Bagozzi, R., W. Verbeke and J.C. Gavino (2003), 'Culture moderates the self-regulation of shame and its effects on performance: the case of salespersons in the Netherlands and the Philippines', *Journal of Applied Psychology*, **88**, 219–33.
- Barbas, H., S. Saha, N. Rempel-Crower and T. Ghashghaei (2003), 'Serial pathways from primate prefrontal cortex to autonomic areas may influence emotional expression', *BMC Neuroscience*, **4**, 25–37.
- Barclay, L.J., D.P. Skarlicki and S.D. Pugh (2005), 'Exploring the role of emotions in injustice perceptions and retaliation', *Journal of Applied Psychology*, **90**, 629–43.
- Barrett, L.F. (1998), 'Discrete emotions or dimensions? The role of valence focus and arousal focus', *Cognition and Emotion*, **12**, 579–99.
- Barrett, L.F. (2004), 'Feelings or words? Understanding the content in self-report ratings of experienced emotion', *Journal of Personality and Social Psychology*, **87**, 266–81.
- Barrett, L.F. (2006), 'Solving the emotion paradox: categorization and the experience of emotion', *Personality and Social Psychology Review*, **10**, 20–46.
- Barrett, L.F. and T. Fossium (2001), 'Mental representations of affect knowledge', *Cognition and Emotion*, **15**, 333–64.
- Barrett, L.F., B. Mesquita, K.N. Ochsner and J.J. Gross (2007), 'The experience of emotion', *Annual Review of Psychology*, **58**, 373–403.
- Barrett, L.F. and J.A. Russell (1998), 'Independence and bipolarity in the structure of current affect', *Journal of Personality and Social Psychology*, **74**, 967–84.
- Barry, B. and R.L. Oliver (1996), 'Affect in dyadic negotiation: a model and propositions', *Organizational Behavior and Human Decision Processes*, **67**, 127–43.
- Barsade, S.G. (2002), 'The ripple effect: emotional contagion and its influence on group behavior', *Administrative Science Quarterly*, **47**, 644–75.
- Bartel, C.A. and R. Saavedra (2000), 'The collective construction of work group moods', *Administrative Science Quarterly*, **45**, 197–231.
- Beal, D., H.M. Weiss, E. Barros and S.M. MacDermid (2005), 'An episodic process model of affective influences on performance', *Journal of Applied Psychology*, **90**, 1054–68.
- Block, J. (1957), 'Studies in the phenomenology of emotions', *Journal of Abnormal and Social Psychology*, **54**, 358–63.
- Bradburn, N.M. (1969), *The Structure of Psychological Well-being*, Chicago, IL: Aldine.
- Brief, A.P., M.J. Burke, J.M. George, B.S. Robinson and J. Webster (1988), 'Should negative affectivity remain an unmeasured variable in the study of job stress?', *Journal of Applied Psychology*, **73**, 193–8.
- Brief, A.P. and H.M. Weiss (2002), 'Organizational behavior: affect in the workplace', *Annual Review of Psychology*, **53**, 279–307.
- Brockner, J. and E.T. Higgins (2001), 'Regulatory focus theory: implications for the study of emotions at work', *Organizational Behavior and Human Decision Processes*, **86**, 35–66.
- Brown, K.G. (2005), 'An examination of the structure and nomological network of trainee reactions: a closer look at "Smile Sheets"', *Journal of Applied Psychology*, **90**, 991–1001.
- Brown, S.P., R.A. Westbrook and G. Challagalla (2005), 'Good cope, bad cope: adaptive and maladaptive coping strategies following a critical negative work event', *Journal of Applied Psychology*, **90**, 792–8.

- Bush, L.E. (1973), 'Individual differences multidimensional scaling of adjectives denoting feelings', *Journal of Personality and Social Psychology*, **25**, 50–57.
- Butt, A.N., J.N. Choi and A. Jaeger (2005), 'The effects of self-emotion, counterpart emotion, and counterpart behavior on negotiator behavior: a comparison of individual-level and dyad-level dynamics', *Journal of Organizational Behavior*, **26**, 681–704.
- Cabanac, M. (2002), 'What is emotion?', *Behavioral Processes*, **60**, 69–83.
- Cacioppo, J.T. and G.G. Berntson (1994), 'Relationship between attitudes and evaluative space: a critical review, with emphasis on the separability of positive and negative substrates', *Psychological Bulletin*, **115**, 401–23.
- Cacioppo, J.T., W.L. Gardner and G.G. Berntson (1997), 'Beyond bipolar conceptualizations and measures: the case of attitudes and evaluative space', *Personality and Social Psychology Review*, **1**, 3–25.
- Cacioppo, J.T., W.L. Gardner and G.G. Berntson (1999), 'The affect system has parallel and integrative processing components: form follows function', *Journal of Personality and Social Psychology*, **76**, 839–55.
- Carroll, J.M., M.S.M. Yik, J.A. Russell and L.F. Barrett (1999), 'On the psychometric principles of affect', *Review of General Psychology*, **3**, 14–22.
- Carver, C.S. and T.L. White (1994), 'Behavioral inhibition, behavioral activation, and affective responses to impending reward and punishment: the BIS/BAS scales', *Journal of Personality and Social Psychology*, **67**, 319–33.
- Cliff, N. and F.W. Young (1968), 'On the relation between unidimensional judgments and multidimensional scaling', *Organizational Behavior and Human Performance*, **3**, 269–85.
- Cole, M.S., H. Bruch and B. Vogel (2006), 'Emotion as mediators of the relations between perceived supervisor support and psychological hardness on employee cynicism', *Journal of Organizational Behavior*, **27**, 463–84.
- Creyer, E.H. and J.C. Kozup (2003), 'An examination of the relationships between coping styles, task-related affect, and the desire for decision assistance', *Organizational Behavior and Human Decision Processes*, **90**, 37–49.
- Cropanzano, R., H.M. Weiss, J.M.S. Hale and J. Reb (2003), 'The structure of affect: reconsidering the relationship between negative and positive affectivity', *Journal of Management*, **29**, 831–57.
- Damasio, A. (1999), *The Feeling of What Happens: Body and Emotion in the Making of Consciousness*, New York: Harcourt, Brace.
- Davison, M.L. (1983), *Multidimensional Scaling*, Toronto: Wiley.
- De Cremer, D. and A. Van Hiel (2006), 'Effects of another person's fair treatment on one's own emotions and behaviors: the moderating role of how much the other cares for you', *Organizational Behavior and Human Decision Processes*, **100**, 231–49.
- Diener, E. and R.A. Emmons (1984), 'The independence of positive and negative affect', *Journal of Personality and Social Psychology*, **47**, 1105–17.
- Dittmann, A.T. (1972), *Interpersonal Messages of Emotion*, New York: Springer.
- Duncan, S. and L.F. Barrett (2007), 'Affect is a form of cognition: a neurobiological analysis', *Cognition and Emotion*, **21**, 1184–211.
- Duncan, S., L.F. Barrett, J.A. Russell and C. Wright (2005), 'The great bipolarity debate: much ado about nothing?', unpublished manuscript, Boston College.
- Eisenberger, R., S. Armeli, B. Rexwinkel, P.D. Lynch and I. Rhoades (2001), 'Reciprocation of perceived organizational support', *Journal of Applied Psychology*, **86**, 42–51.
- Elsbach, K.D. and P.S. Barr (1999), 'The effects of mood on individuals' use of structured decision protocols', *Organization Science*, **10**, 181–98.
- Erez, A. and A.M. Isen (2002), 'The influence of positive affect on the components of expectancy motivation', *Journal of Applied Psychology*, **87**, 1055–67.
- Feldman, L.A. (1995a), 'Valence-focus and arousal-focus: individual differences in the structure of affective experience', *Journal of Personality and Social Psychology*, **69**, 153–66.
- Feldman, L.A. (1995b), 'Variations in the circumplex structure of mood', *Personality and Social Psychology Bulletin*, **21**, 806–17.
- Fessler, D.M.T., E.G. Pillsworth and T.J. Flanson (2004), 'Angry men and disgusted women: an evolutionary approach to the influence of emotions on risk taking', *Organizational Behavior and Human Decision Processes*, **95**, 107–23.
- Fillenbaum, S. and A. Rapaport (1971), *Structures in the Subjective Lexicon*, New York: Academic Press.
- Fineman, S. (ed.) (2000), *Emotion in Organizations* (2nd edn), London: Sage.
- Fisher, C.D. (2000), 'Mood and emotions while working: missing pieces of job satisfaction?', *Journal of Organizational Behavior*, **90**, 185–202.
- Fisher, C.D. and N.M. Ashkanasy (2000), 'The emerging role of emotions in work life: an introduction', *Journal of Organizational Behavior*, **21**, 123–9.
- Fitness, J. (2000), 'Anger in the workplace: an emotion script approach to anger episodes between workers and their superiors, co-workers and subordinates', *Journal of Organizational Behavior*, **90**, 147–62.

- Fong, C.T. (2006), 'The effects of emotional ambivalence on creativity', *Academy of Management Journal*, **49**, 1016–30.
- Forgas, J.P. and J.M. George (2001), 'Affective influences on judgments and behavior in organizations: an information processing perspective', *Organizational Behavior and Human Decision Processes*, **86**, 3–34.
- Friedman, R.A., J.M. Brett, C. Anderson, M. Olekalns, N. Goates and C.C. Lisco (2004), 'The positive and negative effects of anger on dispute resolution: evidence from electronically mediated disputes', *Journal of Applied Psychology*, **89**, 369–76.
- Fuller, J.A., J.M. Stanton, G.G. Fisher, C. Spitzmuller, S.S. Russell and P.C. Smith (2003), 'A lengthy look at the daily grind: times series analysis of events, mood, stress, and satisfaction', *Journal of Applied Psychology*, **88**, 1019–33.
- George, J.M. and J. Zhou (2002), 'Understanding when bad moods foster creativity and good ones don't: the role of context and clarity of feelings', *Journal of Applied Psychology*, **87**, 687–97.
- Ghashghaei, H.T. and H. Barbas (2002), 'Pathways for emotion: interactions of prefrontal and anterior temporal pathways in the amygdale of the rhesus monkey', *Neuroscience*, **115**, 1261–79.
- Green, D.P., S.L. Goldman and P. Salovey (1993), 'Measurement error masks bipolarity in affect ratings', *Journal of Personality and Social Psychology*, **64**, 1029–41.
- Green, R.S. and N. Cliff (1975), 'Multidimensional comparisons of structures of vocally and facially expressed emotion', *Perception and Psychophysics*, **17**, 429–38.
- Guttman, L. (1957), 'A new approach to factor analysis: the radex', in P.F. Lazarsfeld (ed.), *Mathematical Thinking in the Social Sciences*, New York: Columbia University Press, pp. 258–348.
- Heller, D. and D. Watson (2005), 'The dynamic spillover of satisfaction between work and marriage: the role of time and mood', *Journal of Applied Psychology*, **90**, 1273–79.
- Huy, Q.N. (2002), 'Emotional balancing of organizational continuity and radical change: the contribution of middle managers', *Administrative Science Quarterly*, **47**, 31–69.
- Ilies, R. and T.A. Judge (2002), 'Understanding the dynamic relationships among personality, mood, and job satisfaction: a field experience sampling study', *Organizational Behavior and Human Decision Processes*, **89**, 1119–39.
- Ilies, R. and T.A. Judge (2005), 'Goal regulation across time: the effects of feedback and affect', *Journal of Applied Psychology*, **90**, 453–67.
- Isen, A.M. (2000), 'Positive affect and decision making', in M. Lewis and J.M. Haviland-Jones (eds), *Handbook of Emotions*, 2nd edn, New York: Guilford, pp. 417–35.
- Isen, A.M., K.A. Daubman and G.P. Nowicki (1987), 'Positive affect facilitates creative problem-solving', *Journal of Personality and Social Psychology*, **51**, 1122–31.
- Judge, T.A. and R. Ilies (2004), 'Affect and job satisfaction: a study of their relationship at work and at home', *Journal of Applied Psychology*, **89**, 661–73.
- Judge, T.A., B.A. Scott and R. Ilies (2006), 'Hostility, job attitudes, and workplace deviance: test of a multilevel model', *Journal of Applied Psychology*, **91**, 126–38.
- Kelly, J.R. and S.G. Barsade (2001), 'Mood and emotions in small groups and work teams', *Organizational Behavior and Human Decision Processes*, **86**, 99–130.
- Kiefer, T. (2005), 'Feeling bad: antecedents and consequences of negative emotions in ongoing change', *Journal of Organizational Behavior*, **26**, 875–97.
- Kochler, J.J. and A.D. Gershoff (2003), 'Betrayal aversion: when agents of protection become agents of harm', *Organizational Behavior and Human Decision Processes*, **90**, 244–61.
- Kogut, T. and I. Ritov (2005), 'The singularity effect of identified victims in separate and joint evaluations', *Organizational Behavior and Human Decision Processes*, **97**, 106–16.
- Kringelbach, M.L. and E.T. Rolls (2004), 'The functional neuroanatomy of the human orbitofrontal cortex: evidence from neuroimaging and neuropsychology', *Progress in Neurobiology*, **72**, 341–72.
- Lang, P.J., M.M. Bradley, J.R. Fitzsimmons, B.N. Cuthbert, J.D. Scott, B. Moulder and V. Nangia (1998), 'Emotional arousal and activation of the visual cortex: an fMRI analysis', *Psychophysiology*, **35**, 199–210.
- Larsen, R.J. and E. Diener (1992), 'Promises and problems with the circumplex model of emotion', in M. Clark (ed.), *Review of Personality and Social Psychology*, vol. 13, Newburg Park, CA: Sage, pp. 25–59.
- Larsen, R.J. and M. Kasimatis (1990), 'Individual differences in entrainment of mood to the weekly calendar', *Journal of Personality and Social Psychology*, **58**, 164–71.
- Lee, K. and N.J. Allen (2002), 'Organizational citizenship behavior and workplace deviance: the role of affect and cognitions', *Journal of Applied Psychology*, **87**, 131–42.
- Levenson, R.W., L.L. Carstensen and J.M. Gottman (1994), 'Influence of age and gender on affect, physiology, and their interrelations: a study of long-term marriages', *Journal of Personality and Social Psychology*, **67**, 56–68.
- Lewis, K.M. (2000), 'When leaders display emotion: how followers respond to negative emotional expression of male and female leaders', *Journal of Organizational Behavior*, **21**, 221–34.

- Madjar, N., G.R. Oldham and M.G. Pratt (2002), 'There's no place like home? The contributions of work and nonwork creativity support to employees' creative performance', *Academy of Management Journal*, **45**, 757–67.
- Maitlis, S. and H. Ozcelik (2004), 'Toxic decision processes: a study of emotion and organizational decision making', *Organization Science*, **15**, 375–93.
- McCrae, R.R. and P.T. Costa (1991), 'Adding *Liebe und Arbeit*: the full five-factor model and well-being', *Personality and Social Psychology Bulletin*, **17**, 227–32.
- Meyer, G.J. and J.R. Shack (1989), 'Structural convergence of mood and personality: evidence for old and new directions', *Journal of Personality and Social Psychology*, **57**, 691–706.
- Mittal, V. and W.T. Ross (1998), 'The impact of positive and negative affect and issue framing on issue interpretation and risk taking', *Organizational Behavior and Human Decision Processes*, **76**, 298–324.
- Nadal, L. and M. Moscovitch (1998), 'Hippocampal contributions to cortical plasticity', *Neuropharmacology*, **37**, 431–9.
- Nauta, W. (1971), 'The problem of the frontal lobe: a reinterpretation', *Journal of Psychiatric Research*, **8**, 167–87.
- O'Connor, K.M. and J.A. Arnold (2001), 'Distributive spirals: negotiation impasses and the moderating role of disputant self-efficacy', *Organizational Behavior and Human Decision Processes*, **84**, 148–76.
- Ongur, D., A.T. Ferry and J.L. Price (2003), 'Architectonic subdivision of the human orbital and medial prefrontal cortex', *Journal of Comparative Neurology*, **460**, 425–49.
- Ongur, D. and J.L. Price (2000), 'The organization of networks within the orbital and medial prefrontal cortex of rats, monkeys and humans', *Cerebral Cortex*, **10**, 206–19.
- Osgood, C.E., G.J. Suci and P.H. Tannenbaum (1957), *The Measurement of Meaning*, Urbana, IL: University of Illinois Press.
- Parkinson, B., R.B. Briner, S. Reynolds and P. Totterdell (1996), 'Time frames for emotion: relations between momentary and generalized ratings of affect', *Personality and Social Psychology Bulletin*, **21**, 331–9.
- Perrewé, P.L. and K.L. Zellars (1999), 'An examination of attributions and emotions in the transactional approach to the organizational stress process', *Journal of Organizational Behavior*, **20**, 739–52.
- Pieters, R. and M. Zeelenberg (2005), 'On bad decisions and deciding badly: when intention–behavior inconsistency is regrettable', *Organizational Behavior and Human Decision Processes*, **97**, 18–30.
- Pugh, S.D. (2001), 'Service with a smile: emotional contagion in the service encounter', *Academy of Management Journal*, **44**, 1018–27.
- Raghunathan, R. and M.T. Pham (1999), 'All negative moods are not equal: motivational influences of anxiety and sadness on decision making', *Organizational Behavior and Human Decision Processes*, **79**, 56–77.
- Ratner, R.K. and K.C. Herbst (2005), 'When good decisions have bad outcomes: the impact of affect on switching behavior', *Organizational Behavior and Human Decision Processes*, **96**, 23–37.
- Reich, J.W., A.J. Zautra and M. Davis (2003), 'Dimensions of affect relationships: models and their integrative implications', *Review of General Psychology*, **7**, 66–83.
- Reisenzein, R. (1994), 'Pleasure-activation theory and the intensity of emotions', *Journal of Personality and Social Psychology*, **67**, 525–39.
- Remington, N.A., L.R. Fabrigar and P.S. Visser (2000), 'Reexamining the circumplex model of affect', *Journal of Personality and Social Psychology*, **79**, 286–300.
- Rothbard, N.P. (2001), 'Enriching or depleting? The dynamics of engagement in work and family roles', *Administrative Science Quarterly*, **46**, 655–84.
- Russell, J.A. (1978), 'Evidence of convergent validity on the dimensions of affect', *Journal of Personality and Social Psychology*, **36**, 1152–68.
- Russell, J.A. (1980), 'A circumplex model of affect', *Journal of Personality and Social Psychology*, **39**, 1161–78.
- Russell, J.A. (1983), 'Pancultural aspects of the human conceptual organization of emotions', *Journal of Personality and Social Psychology*, **45**, 1281–8.
- Russell, J.A. (1991), 'Culture and the categorization of emotions', *Psychological Bulletin*, **110**, 426–50.
- Russell, J.A. (2003), 'Core affect and the psychological construction of emotion', *Psychological Review*, **110**, 145–72.
- Russell, J.A. and L.F. Barrett (1999), 'Core affect, prototypical emotional episodes, and other things called emotion: dissecting the elephant', *Journal of Personality and Social Psychology*, **76**, 805–19.
- Russell, J.A. and M. Bullock (1985), 'Multidimensional scaling of emotional facial expression: similarity from preschoolers to adults', *Journal of Personality and Social Psychology*, **38**, 1290–98.
- Russell, J.A. and J.M. Carroll (1999), 'On the bipolarity of positive and negative affect', *Psychological Bulletin*, **125**, 3–30.
- Russell, J.A., M. Lewicka and T. Niit (1989a), 'A cross-cultural study of a circumplex model of affect', *Journal of Personality and Social Psychology*, **57**, 848–56.
- Russell, J.A. and D. Ridgeway (1983), 'Dimensions underlying children's emotion concepts', *Developmental Psychology*, **19**, 795–804.

- Russell, J.A. and J.H. Steiger (1982), 'The structure in persons implicit taxonomy of emotions', *Journal of Research in Personality*, **16**, 447-69.
- Russell, J.A., A. Weiss and G.A. Mendelsohn (1989b), 'Affect grid: a single-item scale of pleasure and arousal', *Journal of Personality and Social Psychology*, **57**, 493-502.
- Saavedra, R. and S.K. Kwun (2000), 'Affective states in job characteristics theory', *Journal of Organizational Behavior*, **21**, 131-46.
- Schlosberg, H. (1941), 'A scale for the judgment of facial expressions', *Journal of Experimental Psychology*, **29**, 497-510.
- Schlosberg, H. (1952), 'The description of facial expressions in terms of two dimensions', *Journal of Experimental Psychology*, **44**, 229-37.
- Schlosberg, H. (1954), 'Three dimensions of emotion', *Psychological Review*, **61**, 81-8.
- Seo, M., L.F. Barrett and J.M. Bartunek (2004), 'The role of affective experience in work motivation', *Academy of Management Review*, **29**, 423-39.
- Shepard, R.N. (1962), 'The analysis of proximities: multidimensional scaling with an unknown distance function', *Psychometrika*, **27**, 219-46.
- Shepard, R.N. (1978), 'The mental image', *American Psychologist*, **33**, 125-37.
- Shiv, B. and A. Fedorikhin (2002), 'Spontaneous versus controlled influences of stimulus-based affect on choice behavior', *Organizational Behavior and Human Decision Processes*, **87**, 342-70.
- Steele-Johnson, D., R.S. Beauregard, P.B. Hoover and A.M. Schmidt (2000), 'Goal orientation and task demand effects on motivation, affect, and performance', *Journal of Applied Psychology*, **85**, 724-38.
- Stone, D.N. and K. Kadous (1997), 'The joint effects of task-related negative affect and task difficulty in multi-attribute choice', *Organizational Behavior and Human Decision Processes*, **70**, 159-74.
- Sy, T., S. Côté and R. Saavedra (2005), 'The contagious leader: impact of the leader's mood on the mood of group members, group affective tone, and group process', *Journal of Applied Psychology*, **90**, 295-305.
- Tellegen, A. (1985), 'Structures of mood and personality and their relevance to assessing anxiety, with an emphasis on self-report', in A.H. Tuma and J.D. Maswer (eds), *Anxiety and the Anxiety Disorders*, Hillsdale, NJ: Erlbaum, pp. 681-706.
- Tellegen, A., D. Watson and L.A. Clark (1999), 'On the dimensional and hierarchical structure of affect', *Psychological Science*, **10**, 297-303.
- Thayer, R.E. (1989), *The Biopsychology of Mood and Activation*, Oxford and New York: Oxford University Press.
- Totterdell, P. (2000), 'Catching moods and hitting runs: mood linkage and subjective performance in professional sport teams', *Journal of Applied Psychology*, **85**, 848-59.
- Totterdell, P., T. Wall, D. Holman, H. Diamond and O. Epitoropaki (2004), 'Affect networks: a structural analysis of the relationship between work ties and job-related affect', *Journal of Applied Psychology*, **89**, 854-67.
- Tsai, J.L., B. Knutson and H.H. Fung (2006), 'Cultural variation in affect valuation', *Journal of Personality and Social Psychology*, **90**, 288-307.
- Tulving, E. (1972), 'Episodic and semantic memory', in E. Tulving and W. Donaldson (eds), *Organization of Memory*, New York: Academic Press, pp. 381-403.
- Van Dijk, E. and M. Zeelenberg (2005), 'On the psychology of "if only": regret and the comparison between factual and counterfactual outcomes', *Organizational Behavior and Human Decision Processes*, **97**, 152-60.
- Warr, P.B., J. Barter and G. Brownbridge (1983), 'On the independence of positive and negative affect', *Journal of Personality and Social Psychology*, **44**, 644-51.
- Watson, D. (1988a), 'The vicissitudes of mood measurement: effects of varying descriptors, time frames, and response formats on measures of positive and negative affect', *Journal of Personality and Social Psychology*, **55**, 128-41.
- Watson, D. (1988b), 'Intraindividual and interindividual analyses of positive and negative affect: their relation to health complaints, perceived stress, and daily activities', *Journal of Personality and Social Psychology*, **54**, 1020-30.
- Watson, D. and L.A. Clark (1984), 'Negative affectivity: the disposition to experience aversive emotional states', *Psychological Bulletin*, **96**, 465-90.
- Watson, D. and L.A. Clark (1992), 'On traits and temperament: general and specific factors of emotional experience and their relation to the five factor model', *Journal of Personality*, **60**, 441-76.
- Watson, D. and L.A. Clark (1997), 'Measurement and mismeasurement of mood: recurrent and emergent issues', *Journal of Personality Assessment*, **68**, 267-96.
- Watson, D., L.A. Clark, C.W. McIntyre and S. Hamaker (1992), 'Affect, personality, and social activity', *Journal of Personality and Social Psychology*, **63**, 1011-25.
- Watson, D., L.A. Clark and A. Tellegen (1984), 'Cross-cultural convergence in the structure of mood: a Japanese replication and a comparison with U.S. findings', *Journal of Personality and Social Psychology*, **47**, 127-44.
- Watson, D., L.A. Clark and A. Tellegen (1988), 'Development and validation of brief measures of positive and negative affect: the PANAS scales', *Journal of Personality and Social Psychology*, **54**, 1063-70.

- Watson, D. and A. Tellegen (1985), 'Toward a consensual structure of mood', *Psychological Bulletin*, **98**, 219–35.
- Watson, D., D. Wiese, J. Vaidya and A. Tellegen (1999), 'The two general activation systems of affect: structural findings, evolutionary considerations, and psychobiological evidence', *Journal of Personality and Social Psychology*, **76**, 820–38.
- Weiss, H.M. (2002), 'Conceptual and empirical foundations for the study of affect at work', in R.G. Lord, R.J. Klimoski and R. Kamfer (eds), *Emotions in the Workplace: Understanding the Structure and Role of Emotions in Organizational Behavior*, San Francisco, CA: Jossey-Bass, pp. 20–63.
- Weiss, H.M. and R. Cropanzano (1996), 'Affective events theory: a theoretical discussion of the structure, causes and consequences of affective experiences at work', in B.M. Staw and L.L. Cummings (eds), *Research in Organizational Behavior*, vol. 18, Greenwich, CT: JAI Press, pp. 1–74.
- Weiss, H.M., J.P. Nicholas and C.S. Daus (1999a), 'An examination of the joint effects of affective experiences and job beliefs on job satisfaction and variations in affective experiences over time', *Organizational Behavior and Human Decision Processes*, **28**, 1–24.
- Weiss, H.M., K. Suckow and R. Cropanzano (1999b), 'Effects of justice conditions on discrete emotions', *Journal of Applied Psychology*, **84**, 786–94.
- Wong, K.F., M. Yik and J.Y. Kwong (2006), 'Understanding the emotional aspects of escalation of commitment: the role of negative affect', *Journal of Applied Psychology*, **91**, 282–97.
- Woodworth, R.S. (1938), *Experimental Psychology*, New York: Holt.
- Wright, T.A. and B.M. Staw (1999), 'Affect and favorable work outcomes: two longitudinal tests of the happy-productive worker thesis', *Journal of Organizational Behavior*, **20**, 1–23.
- Wundt, W. (1924), *An Introduction to Psychology* (R. Pintner, trans.), London: Allen & Unwin. (Original work published 1912.)
- Yik, M.S.M., J.A. Russell and L.F. Barrett (1999), 'Integrating four structures of current mood into a circumplex: integration and beyond', *Journal of Personality and Social Psychology*, **77**, 600–619.
- Zevon, M.A. and A. Tellegen (1982), 'The structure of mood change: an idiographic/nomothetic analysis', *Journal of Personality and Social Psychology*, **43**, 111–22.
- Zohar, D., O. Tzischinski and R. Epstein (2003), 'Effects of energy availability on immediate and delayed emotional reactions to work events', *Journal of Applied Psychology*, **88**, 1082–93.