

The Structure of Current Affect: Controversies and Emerging Consensus

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Abstract

For some years now, emotion researchers have debated a series of issues related to the structure of consciously experienced affective states. The present article reviews evidence that current affective experience can be summarized by a structure that is anchored by two bipolar but independent dimensions of experience, pleasure and activation. Four issues have presented themselves as central to the nature of this structure: the number of dimensions necessary to describe the space, the bipolarity of the dimensions, whether the structure displays a circumplex shape, and the definition of the activation dimension. Points of consensus and the remaining controversies regarding each issue are presented.

Keywords

affect; emotion; circumplex; pleasure; activation

For some years now, emotion researchers have debated a series of issues related to the structure of consciously experienced affective states. The structure of affect helps organize their exploration, understanding, and measurement of the affective domain. Coming to consensus on this structure is important because knowledge about affective phenomena would accumulate more rapidly if researchers could organize their thinking around one consensually held de-

scriptive system with a common set of terms. The purpose of the present article is to familiarize readers with points of consensus as well as the remaining controversies regarding this structure.

THE TWO-DIMENSIONAL STRUCTURE OF AFFECT

Affective structure has been interpreted in several different ways, each with its own measurement model, conceptual framework, and accumulating literature (see Fig. 1). The original pleasure-activation model has its origins in Wundt (1912/1924) and Schlosberg (1941), and is represented most recently by the second author (Russell, 1980), Larsen and Diener (1992), and Reisenzein (1994). In this descriptive structure, pleasure-displeasure (or valence) is a dimension of experience that refers to hedonic tone. Activation is a dimension of experience that refers to a sense of mobilization or energy. A person senses being somewhere on a continuum ranging from sleep (at the low end), through drowsiness, relaxation, alertness, hyperactivation, and, finally, frenetic excitement (at the opposite end).

Alternative interpretations of the structure exist. In contrast to separating pleasantness and activation dimensions, Watson and Tellegen (1985) defined affective structure in terms of two dimensions of valence (i.e., Positive and Negative Affect) that implicitly communicate activation; in fact, Watson and Tellegen have recently

renamed their dimensions Positive and Negative Activation. Thayer (1989) defined it in terms of two dimensions of activation (i.e., Tension and Energy), and his two activation dimensions implicitly communicate valence. From the names, one would think that the different sets of dimensions in the various models describe different phenomena. Researchers are now coming to understand, however, that the four systems diagrammed in Figure 1 describe the same structure viewed in different ways (Yik, Russell, & Feldman Barrett, in press).

We have proposed that current affect can be described as a space formed by two bipolar, but independent dimensions, degree of pleasantness and degree of activation (see Fig. 2). Despite other disagreements, writers from the pre-Socratics, through Spinoza and introspectionists like Wundt, to current-day theorists have described emotion as some form of pleasure or displeasure. All known human languages have words to communicate pleasure or displeasure (Wierzbicka, 1992), and the pleasure-displeasure dimension is pancultural in emotion lexicons (Russell, 1991). The activation dimension has been prominent in theories of emotion throughout most of this century. Although, as Figure 1 indicates, other researchers have attempted to emphasize one dimension over the other, we maintain that independent pleasure and activation dimensions are required to understand affective feelings clearly and that to otherwise combine these properties confounds distinct aspects of the space and causes immeasurable confusion.

Four issues have presented themselves as central to the nature of this structure. We address each issue in turn, and demonstrate where points of consensus have recently emerged, or where controversies remain.

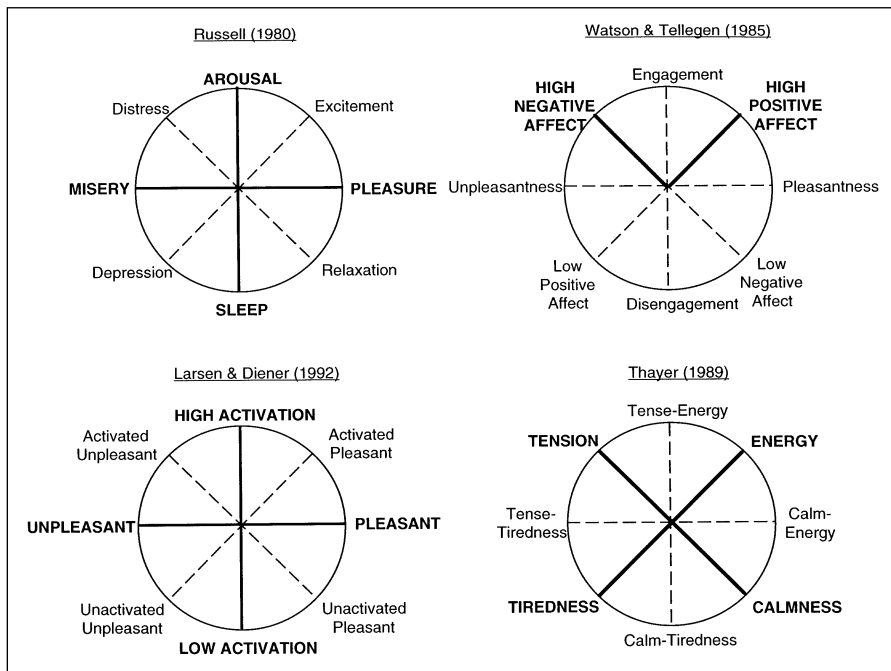


Fig. 1. Four descriptive models of affect within a two-dimensional space. Reprinted from Yik, Russell, and Feldman Barrett (in press).

The Number of Dimensions

The number of dimensions required to describe affect is two. Two dimensions have appeared in studies of self-reported feelings, in the semantics of affect-related

words across many cultures, and in ratings of facial expression of emotion (for reviews, see Russell, 1980, 1991). One dimension is rarely enough to capture all of the important aspects of the space, and additional dimensions (e.g., dominance,

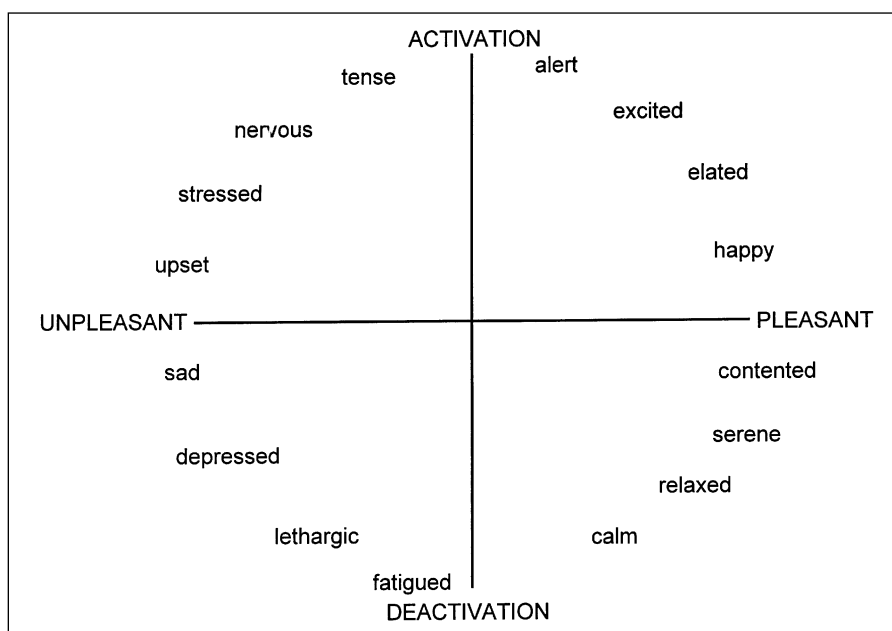


Fig. 2. A schematic for the two-dimensional structure of affect. Adapted from Feldman Barrett and Russell (1998).

affiliativeness) can be interpreted as cognitive construals of the causes and consequences of the affect state. That is, pleasantness and activation capture the core affective feelings involved in mood and emotion, but do not reflect all the components involved when people think of clear cases of emotion, such as falling in love, becoming jealous, or being ashamed of oneself (for a discussion, see Russell & Feldman Barrett, in press).

Bipolarity of Positive and Negative

Much recent work has been devoted to the topic of whether positive and negative affective states are independent or bipolar opposites. Many researchers have claimed that pleasant affective states are independent of unpleasant affective states. The challenge to bipolarity has come in three forms.

The first challenge to bipolarity has come in the form of *independence by definition*. In some models, positive and negative affect have been defined in such a way as to produce independence. For example, Watson and Tellegen (1985) have picked independent dimensions to anchor the affective space, and have called them Positive and Negative Affect (or PANAS [Positive Affect Negative Affect Schedule]-PA and PANAS-NA, respectively). So defined, PANAS-PA is the combination of pleasantness and high activation; PANAS-NA, the combination of unpleasantness and high activation. These affective states are about 90° apart in the structure of affect, resulting in a correlation between them of approximately zero. Defined in this way, Positive Affect and Negative Affect are not semantic opposites, and one would not expect them to be bipolar opposites. Thus, in a two-dimensional space, if these

two independent dimensions are named positive and negative, then the independence of positive and negative affect is achieved by definition.

The second challenge to bipolarity has come in the form of *empirical independence*. Many research articles have reported small observed correlations between pleasant and unpleasant affective states that are not forced to be independent through definitions. There are several reasons why the observed correlation between pleasant and unpleasant affect is substantially weaker than -1 ; these reasons include the role of semantics (as described in the previous paragraph), the time span sampled (Diener & Emmons, 1984), the role of random and systematic measurement error (Feldman Barrett & Russell, 1998; Green, Goldman, & Salovey, 1993), the type of response format (Russell & Carroll, in press), and failure to specify the precise model of semantically bipolar opposites (Feldman Barrett & Russell, 1998). When positive and negative affect are defined as semantic opposites and measured as current feeling states, and when the other measurement factors are taken into account, positive and negative affect are indeed bipolar opposites. Prototypically pleasant and unpleasant affective states (like happy and sad) are strongly negatively correlated (latent correlations² range from $-.84$ to $-.93$, with an average of $-.90$; Carroll, Yik, Russell, & Feldman Barrett, in press).

The third challenge to bipolarity has come in the form of *neurophysiological independence*. It has been argued that the bipolarity seen in affective space is not observed at the neurophysiological level (Cacioppo, Gardner, & Bernston, 1997) and therefore must be questioned as a basic principle of affect. We define affect, however, as consisting of consciously accessible elementary feelings of pleasure-dis-

pleasure and activation, along with their neurophysiological counterparts. The structure of the underlying physiology need not be isomorphic with the structure of the conscious, phenomenal feeling (although if bipolarity is a genuine feature of affect at the psychological level, then it must be accounted for by the neural mechanisms involved). Indeed, Cacioppo et al. (1997) conceded that even if the neural processes of affect are independent of one another, bipolarity is likely to emerge in forming conscious affective feelings.

Circumplex Versus Simple Structure

Affective structure is more consistent with a circumplex structure (i.e., items spread more or less evenly around the perimeter of the space) than with simple structure (i.e., items falling into tight clusters, with gaps between the clusters). Although both geometric configurations are just convenient approximations for depicting affective space, configurations of affective space do not meet minimal criteria for simple structure according to empirical indices, and SEM (Structural Equation Modeling)³ procedures yield solutions with items spread around the periphery of the two-dimensional space when the entire space is sampled broadly (Russell & Feldman Barrett, in press).

What Is the Activation Dimension?

The concept of activation, or arousal, has a long history in theories of emotion, but there has been persistent confusion in its definition. Some researchers have mistakenly believed that self-reported activation represents a direct index of physiological arousal, whereas the pleasantness dimension represents affect itself. From our per-

spective, both activation and pleasantness are dimensions of conscious experience that have neurophysiological correlates (e.g., see reviews by Heilman, 1997; Lang, Bradley, & Cuthbert, 1997). The exact relationship between felt activation and the underlying neurophysiological events is poorly understood.

There has been a longstanding tendency for researchers from a variety of theoretical perspectives to define activation as intensity, or the magnitude, of a valenced affective response, in part because the intensity of an emotional response is thought to be directly related to the degree of bodily or brain activation. Recent evidence suggests, however, that activation is not reducible to the intensity of a valenced response (Reisenzein, 1994). For example, the latent correlation between felt activation and the intensity of valenced affect ranges from $.08$ to $.39$, with a mean correlation of $.21$ (Feldman Barrett, Russell, & Yik, 1998). In general, these associations are not large enough for one to conclude that activation is equivalent to the intensity of valenced affect.

FUTURE DIRECTIONS

Once researchers agree on the descriptive structure of affective experience, they can move to some practical matters, such as the structure's utility for guiding measurement. There are three main lessons here. First, the names attached to scales are often a poor guide to what is actually being measured. For example, PANAS-PA and PANAS-NA scales do not measure all pleasant and unpleasant affective states, but rather measure only high-activation states. Researchers using those scales might assume that they are sampling the affective domain broadly, but in fact this is

not so. The semantics of the affective space is a better guide to what is actually being measured by a given scale. Second, researchers should decide in advance which parts of the space they need to measure, and select scales accordingly. We maintain that simple pleasure and activation scales should be used whenever affect is being measured. Third, a series of scales, each of which has a different format, should be used whenever affect is being measured. Observed correlations between single scales can often give misleading results.

The more difficult question is what the structure of affect represents. For example, what is the relationship between affective feelings (defined as pleasantness and activation), on the one hand, and emotional episodes, on the other? We speculate that emotional episodes are complex episodic events concerned with specific objects (i.e., persons, conditions, events, or things, real or imagined, in the past, present, or future), whereas affective feelings, although they are caused, are not necessarily consciously directed at specific objects *per se*. An emotional episode conveys more information than simply strong feelings of pleasantness and activation. It includes overt behavior in relation to the object; attention toward, appraisal of, and attributions to the object; the experience of oneself as having the emotion; and of course all the neurophysiological events underlying these psychological happenings. Although emotional episodes are more complex than affect, affective feelings of pleasantness and activation may be central to emotional experience; that is, emotional episodes may not exist without strong affective feelings. As a result, affective structure may capture something necessary, but not sufficient, to emotional episodes. The specific ways in which

pleasantness and activation are related to the other constituents of the emotional response is a matter for further investigation.

One persistent criticism of the pleasure-activation structure is that it is a model of language or words, and it is not clear what the model has to say about actual feelings. Indeed, the pleasure and activation dimensions are two of the three major components of meaning in natural language (evaluation, activity, and potency). Furthermore, analyses of affect words do show a circular structure anchored by independent pleasure and activation dimensions.

We propose that the descriptive structure of affect represents both language and conscious affective experience, and that emotion language, or the cognitive categories it expresses, plays a role in creating conscious emotional experience. From a perspective that views language as a mechanism for transforming experience (as opposed to merely representing it), conscious emotional experiences may be constructed by applying language to affective feelings. The affective structure shown in Figure 2 may represent only the very basics that underlie the cognitive categories used in the constructive process. To say this in no way challenges the idea that infants, and even non-human animals, experience emotion. There is no necessity that the information contained in mental representations or cognitive categories be encoded linguistically, even though it may be represented this way in adult humans.

One implication of this theory—an implication linked to the distinction between affect and emotional episodes—is that emotions are emergent phenomena (i.e., they are constructed out of a number of distinct processes and components). Consider, as an analogy, the concept of memory. Like memories, emotions may not be monolithic

entities evoked in the brain or body (or both), but rather, may be experiences (either implicit or explicit) that are composed of a number of distinct processes, all of which are represented neurochemically. Different parts of the brain hold on to different aspects of an emotional experience, and these aspects are in turn linked together during the act of emoting. From this perspective, emotional experiences (or at least conscious emotional experiences) may be constructed at the time that emoting occurs and that the experiencer is actively involved in the construction process. Furthermore, the structure of affect may be important in the construction of the experience.

Finally, can the pleasure-activation affective structure make a conceptual contribution to future research about affective phenomena? Perhaps theories of emotion (as exemplified in the preceding discussion) or theories of emotional development (as exemplified in Lewis, 1993) should take pleasantness and activation into account as basic and universal dimensions of affect. Furthermore, studies of emotion recognition or social perception of emotion might benefit from considering these more general dimensions.

Certainly, these ideas require careful investigation and at the moment remain speculative at best. There remain a multitude of questions about what, if anything, affective structure has to do with the causes and consequences of affect. But before researchers can answer such questions, they need to develop a consistent framework of precise terminology with which to describe the affective domain and to anchor investigations in a consistent fashion. A circular structure that is characterized by two bipolar but independent dimensions of experience, pleasure and activation, may serve this purpose well until something better comes along.

Recommended Reading

Green, D.P., Goldman, S.L., & Salovey, P. (1993). (See References)
 Lang, P.J., Bradley, M.M., & Cuthbert, B.N. (1997). (See References)
 Larsen, R.J., & Diener, E. (1992). (See References)
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 Watson, D., & Tellegen, A. (1985). (See References)

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Notes

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2. Latent correlations represent an estimate of the relationship between two variables if they were measured without error.

3. For more information on SEM procedures, see Breckler (1990) or Bollen (1989).

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