



Components of Emotional Meaning: A sourcebook

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CHAPTER

2 Dimensional, basic emotion, and componential approaches to meaning in psychological emotion research

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Abstract

The three most important psychological approaches to the meaning of emotion terms are presented, namely the dimensional, basic emotion, and componential emotion approaches. According to the dimensional approaches the emotion domain can be represented by a small number of continuous dimensions. The basic emotion approach assumes that the emotion domain is organized into categorically different affect programs. This approach has inspired psycholinguistic research that represents the emotion domain by hierarchical structures. The componential emotion approach represents emotion terms by profiles of activity in each of the emotion components. Although these three approaches are in many respects incompatible when it comes to the presumed underlying emotion processes, they are compatible with respect to the meaning of emotion terms. The chapter ends by discussing how the GRID paradigm, which is based on the componential emotion approach, can also be fruitfully applied to study categorical and dimensional representations of the emotion domain.

Keywords: [basic emotion approaches](#), [componential emotion approaches](#), [dimensional emotion approaches](#)

Subject: [Developmental Psychology](#), [Social Psychology](#)

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The present chapter focuses on the meaning of emotion words from the perspective of the discipline of psychology. In most psychological studies, the meaning of emotion words is not made explicit. Emotion terms are either indirectly used to construct stimuli (e.g., when actors are asked to display a certain emotion and the displays are then used in recognition tasks), or directly used as stimuli (e.g., when people are asked to recall and describe emotional episodes) or as response scales (e.g., when people are asked to rate their emotional experience on a list of emotion terms). The presumed meaning of emotion terms has to be inferred from the theoretical framework on which the research is based and from the context in which the terms are applied. It is not feasible in the current chapter, though, to give a comprehensive overview of psychological emotion research and the different, often implicit, assumptions made about the meaning of emotion words. Therefore,

the chapter focuses on those approaches that have led to explicit psycholinguistic research on the meaning of emotion terms. The two theoretical approaches that have dominated psycholinguistic research on emotion terms, the dimensional and the basic emotion approach, are at the center of this chapter. Moreover, a third psychological approach, the componential emotion approach, will be discussed. The GRID paradigm, which was presented in the previous chapter and forms the basis for studying the meaning of emotion words throughout the current book, is rooted in the componential emotion approach. The componential emotion approach therefore also receives attention in the current chapter, although this approach has resulted in virtually no psycholinguistic research in the past.

The current chapter is organized into five parts. As most psycholinguistic research on emotion words has been rooted in the dimensional approach, this approach is presented first and most extensively. The basic emotion approach is discussed second. The componential approach to emotion and its implied conceptualization of the meaning of emotion words is examined in the third part. The fourth part focuses on the compatibilities and incompatibilities between the dimensional, basic emotion, and componential approaches with respect to the meaning of emotion terms. The chapter ends with a discussion on how the GRID paradigm can be informed by and be informative for the dimensional and the basic emotion approaches.

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2.1 The dimensional approach

According to the dimensional approach, an emotion, as well as the meaning of an emotion term, can be represented by a specific position within the continuous space that is defined by a small number of underlying dimensions. This approach has an honorable origin. Aristotle (*Rhetorica*) considered the hedonic tone ranging from highly positive to highly negative as a key characteristic of the emotional experience. More dimensions were proposed by the 17th century philosopher Spinoza (1677), who theorized that a key source of variability between the emotions was that they ranged from weak to strong and from less to more persistent. Moreover, the dimensional framework was present in scientific psychology right from its origin. On the basis of introspection, Wilhelm Wundt (1896) proposed the dimensions pleasure–displeasure, arousal–calming, and tension–relaxation (*Lust–Unlust, Erregung–Hemmung, and Spannung–Lösung*). Ever since its introduction into scientific emotion psychology, the dimensional approach to emotions has played (e.g., Schlosberg, 1952), and continues to play, a prominent role, especially in the assessment of affective experiences and in psycholinguistic research on the meaning of emotion words. The following section begins with a discussion of the four most important dimensional models for representing emotional experiences. Subsequently, the psycholinguistic research on the meaning of emotion words from a dimensional approach is introduced. A comparison between the dimensional structure of emotional experiences and the dimensional structure of the meaning of emotion words is next presented. The section then concludes with a note on the labeling of the emotion dimensions.

Dimensional approaches to emotional experiences

Dimensional approaches play a central role in the assessment of emotional, and more broadly, affective experiences. In studies that apply this approach, participants are typically asked to report the degree to which a number of emotion and affect terms describe their own affective experience. The way that people use these terms to describe their own affective experiences, and possibly those of others, can throw an important light on their meaning. Very different models have been proposed to represent self-ratings on a number of affect terms. They share, however, a two-dimensional view on the affective space. The presentation here is restricted to the four most important models in the literature, the positive affect–negative affect model (Watson & Tellegen, 1985), the pleasure–arousal model (Russell, 1980), the pleasantness–activation model (Larsen & Diener, 1992), and the tense arousal and energetic arousal model (Thayer, 1989). The defining characteristics of these four models are first presented, which is followed by a discussion of the two central issues that differentiate these models: the bipolarity of valence and the relevance and dimensionality of arousal.

Four two-dimensional models of emotional experience. The positive affect–negative affect model (Watson & Tellegen, 1985) is the most well-known model, both within and outside emotion psychology. It is often used in theoretical and in applied research. Originally, it was an inductively developed model. According to Watson and Clark (1997), affect measurement reveals three replicable empirical findings: (1) self-ratings on positive affect terms are mutually positively correlated, (2) self-ratings on negative affect terms are mutually positively correlated, and (3) self-ratings on positive affect terms are virtually uncorrelated with self-ratings on negative affect terms. From this observation, Watson and Clark (1997) concluded that although positive and negative affect terms are opposite in meaning, they refer to two distinct and largely unrelated affective systems. The Positive and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988), which is one of the most widely used affect scales, is based on this model. It contains a scale for positive affect and a scale for negative affect, with both scales being virtually uncorrelated.

Russell's pleasure–arousal model (Russell, 1980) proposes two very different dimensions in the affective domain. According to this model, the first factor is a bipolar pleasantness factor on which positive and negative emotions are opposed to one another. The second factor represents the arousal dimension on which high arousal (e.g., nervous) and low-arousal (e.g., calm) affective experiences are opposed to one another.

The pleasantness–activation model of Larsen and Diener (1992) is close to Russell's pleasure–arousal model, although it uses slightly different terms and slightly different labels. It also assumes that positively valenced experiences are opposed to negatively valenced experiences on the first dimension. Moreover, high-activation experiences (e.g., aroused) are opposed to low-activation experiences (e.g., quiet) on the second dimension, which is comparable to Russell's arousal dimension.

The tense arousal and energetic arousal model (Thayer, 1989) is yet another model. This model has the arousal system as its central focus. According to Thayer's theorizing, there are two arousal systems: one system that regulates energetic arousal (which ranges from being sleepy to being energized) and the other that regulates tense arousal (which ranges from being calm to being tense).

The bipolarity of the valence dimension. The first and most important source of disagreement between the four models is the bipolarity of the valence dimension. According to the positive affect–negative affect model (Watson & Tellegen, 1985), positive and negative affect are two virtually uncorrelated dimensions. In this model, it is possible for human emotional experiences to not only be high on positive affect and low on negative affect, or high on negative affect and low on positive affect, but also high on both positive and negative affect at the same time. The second and third models, however, assume that valence is a single bipolar factor. These two models assume that the higher the positive affect during an emotional experience, the lower the negative affect and vice versa. There have been vigorous debates between the proponents of both views. In the course of the debate, the role of methodological factors in the dimensional representation of the emotion

domain has been extensively demonstrated (e.g., Feldman-Barrett & Russell, 1998; Green, Goldman, & Salovey, 1993; Green, Salovey, & Truax, 1999; Russell & Carroll, 1999; Yik, Russell, & Barrett, 1999). The five most important methodological factors are unreliability due to random measurement error, acquiescent response style leading to systematic measurement error, the selection of the affect terms, the formulation of the response scales, and shared method variance. As these methodological factors are also potentially relevant when the meaning of emotion terms is studied, these factors are presented in more detail.

One methodological factor is random measurement error that affects the reliability of the measurement (e.g., Green, Goldman, & Salovey, 1993; Green, Salovey, & Truax, 1999). As is well known in validity research, the reliability of scales determines the upper limit of the observable validity coefficients. The lower the reliability, the more the observed correlations will tend to be closer to zero. Thus, negative correlations will become less negative and positive correlations will become less positive.

p. 34 A second methodological factor is non-random error that is caused by response styles (e.g., Green, Goldman, & Salovey, 1993; Green, Salovey, & Truax, 1999). Acquiescence, in particular, has a systematic effect on the observed correlations. Acquiescence means that participants differ systematically in the tendency to agree with questions or to systematically give a higher or lower score irrespective of the content of the items. This response tendency forces the observed correlations $\nearrow$ upward. Positive correlations will become more positive, and negative correlations will become less negative.

A third methodological factor is the selection of the terms in the instrument. For bipolarity to be observed, affective terms are needed that are genuinely opposite in meaning. This is not the case in the PANAS, which is the most widely used instrument to assess positive and negative affect. Most items from both the positive and negative affect scales share a high level of arousal (e.g., enthusiastic and nervous) (e.g., Feldman-Barrett & Russell, 1998).

A fourth methodological factor is the formulation of the response scale (Russell & Carroll, 1999). A response scale can be formulated from unambiguously unipolar through to unambiguously bipolar. In an unambiguously unipolar response scale, the lowest score means that the affect is absent and the highest score means that the affect is strongly present (e.g., the response categories: 1 “not,” 2 “slightly,” 3 “moderately,” 4 “extremely”). In an unambiguously bipolar scale, the response scale is defined by two opposite affect terms (e.g., “sad” 1 2 3 4 5 “happy”). The range of correlations that can be observed between affect items is determined by the kind of response scale that is used. The unambiguously unipolar response reduces the size of negative correlations between affect terms. It can be demonstrated psychometrically that when the underlying latent correlation between two affect terms is -1 , the strongest negative correlation that can be observed empirically is only -0.46 with an unambiguously unipolar response scale. This effect is due to a highly skewed distribution of the responses with unambiguously unipolar scales (for a detailed account, see Russell & Carroll, 1999). In affect measurement, the use of unambiguously unipolar response scales is most popular, probably because that response scale sounds natural. However, it also reduces the possibility of observing bipolar factors.

A fifth more general methodological effect is shared method variance. Items that are formulated in the same way and that have to be answered in the same way induce common method variance, and this also forces correlations upward (e.g., Feldman-Barrett & Russell, 1998). Combined, these five methodological factors have the same effect on negative correlations: they all lead to less negative correlations. Note that this is not the case for positive correlations: some method effects will make positive correlations less positive (e.g., unreliability) and others will make positive correlations more positive (e.g., acquiescence). It has by now been extensively demonstrated that when all of these methodological factors are controlled for (multimethod approach to counteract acquiescence and shared method variance, not using unambiguously unipolar scales, working with affective terms that are really opposite in meaning, and using confirmatory factor analysis to model unreliability), a high negative correlation is observed between positive and negative affect (e.g., Feldman-Barrett & Russell, 1998; Green, Goldman, & Salovey, 1993; Green, Salovey, & Truax, 1999; Russell & Carroll, 1999;

Yik, Russell, & Barrett, 1999). Thus, on the basis of extensive psychometric and empirical research, the psychometric debate has been closed in favor of the unidimensional bipolar view on valence.

The nature of arousal. The second issue of debate is the presence and the nature of the arousal experience. Russell's pleasure–arousal model (Russell, 1980) and Larsen and Diener's pleasantness–activation model (Larsen & Diener, 1992) assume one bipolar arousal factor, while Thayer's tense arousal and energetic arousal model (Thayer, 1989) supposes two different bipolar arousal factors. Moreover, Watson and Tellegen's positive affect–negative affect model (Watson & Tellegen, 1985) does not even consider arousal as a basic dimension in the affect domain. Extensive empirical research has, however, demonstrated that the discrepancies between these four models are only seeming differences (Yik, Russell, & Feldman-Barrett, 1999). Once the methodological factors that affect bipolarity have been taken into account, the differences between the four affect models can be accounted for by a simple rotation of the dimensions in a two-dimensional representation (see Figure 2.1). Although using a different conceptualization, the four models are thus empirically interchangeable. Russell's pleasure–arousal model and Larsen and Diener's pleasantness–activation model refer to the same rotation of axes, but they use slightly different items and labels for their dimensions. Thayer's tense arousal and energetic arousal model corresponds to a 45° rotation of the axes of Russell's pleasure–arousal model, with energized arousal corresponding to a combination of pleasure and high arousal, and tense arousal corresponding to a combination of misery and high arousal (see Figure 2.1). Moreover, Thayer's tense arousal and energetic arousal model corresponds closely to Watson and Tellegen's positive affect–negative affect model, with positive affect closely relating to the energized arousal pole, and negative affect to the tense arousal pole. Thus, although working with slightly different items (or using only a subset of items) and using different terminology, these four models assess highly similar psychological phenomena. Next to a bipolar valence factor, a bipolar arousal factor has also been identified in the most widely used models to assess affective experiences.



Figure 2.1 Four schematic descriptions of affect as represented by Yik, Russell, & Feldman-Barrett (1999).

Reproduced from *Journal of Personality and Social Psychology*, 77 (4), Yik, M. S. M., Russell, J. A., & Feldman-Barrett, L., Structure of self-reported current affect: integration and beyond pp. 600–619 © 1999, American Psychological Association, with permission.

The debate now centers on the most adequate rotation to represent the internal structure of the affect domain. Some researchers favor the valence–arousal orientation because of the fundamental role of the valence in psychological functioning in general (e.g., Russell & Carroll, 1999). Others favor the positive and negative affect rotation because they assume that this rotation would be congruent with the expected brain architecture (e.g.,

Watson, Wiese, Vaidya, & Tellegen, 1999). In support of the latter claim, circadian rhythms have been shown to have an effect on positive affect, but they are not related to negative affect. As there is rotational indeterminacy from a psychometric point of view, analyses of the internal structure of the instruments alone cannot further contribute to this debate. The most important conclusion for the purpose of the current chapter is that when persons are asked to rate their own emotional experiences on sets of emotion and affect terms from the four most widely used models, their responses can be represented by a bipolar valence and a bipolar arousal dimension, or a rotation thereof.

Dimensional models in psycholinguistic research

Not only have interindividual differences in emotional experiences been studied from the dimensional emotion approach, but so, too, has the meaning of emotion words. This psycholinguistic research has been heavily inspired by Osgood's research on the connotative meaning dimensions in language. Because of its impact, Osgood's findings are presented first, with the psycholinguistic research on the meaning of emotion terms subsequently presented.

Connotative meaning dimensions. In linguistics, a distinction has been made between denotative and connotative meaning (e.g., Osgood, Suci, & Tannenbaum, 1957). While the denotative meaning refers to what a word points to in the world, the connotative meaning refers to the affective loading of a word. In the 1950s, Osgood and colleagues (1957) found that the connotative meaning of English words can be represented in a three-dimensional space, and they developed an instrument to assess the connotative meaning in a standardized way. The basic principle was simple. They identified a set of bipolar pairs of adjectives that people often use in daily language to describe the quality of things (such as big–small, fast–slow, soft–hard). Moreover, they observed that people can easily apply these bipolar adjectives in a metaphorical way to things for which they are not used by default (e.g., to evaluate “house” on the bipolar pair “fast–slow”). More importantly, they found that the ratings of objects and nouns on these bipolar pairs can be represented in a three-dimensional structure in which the dimensions have been interpreted as evaluation (good–bad), potency (strong–weak), and activation (active–passive). Osgood and colleagues thus demonstrated that connotation in English can be represented in a three-dimensional structure.

In an extensive cross-cultural research program, he and his colleagues further investigated the connotative meaning dimensions across many languages and cultural groups (Osgood, May, & Miron, 1975). Rather than just translating the English instrument, they went to great lengths to identify the specific connotative meaning structure within each language. They first identified the bipolar pairs of adjectives that were frequently used within a language (without taking into account the pairs that were identified in other languages). While working with culture- and language-specific bipolar adjectives, they revealed the same underlying universal dimensions of connotative meaning across different languages. Although Osgood and colleagues did not directly study emotion terms, their findings have been considered relevant for the emotion domain. The connotative meaning dimensions are interpreted as affective dimensions. They represent the feelings that are typically associated with words and nouns.

Similarity studies with emotion words. Besides the connotative meaning tradition, there is also a large tradition in psycholinguistics that directly focuses on the meaning of emotion words. In these studies, the perceived similarity between pairs of emotion terms is investigated. Participants are asked either to sort a (presumed) representative set of emotion terms into groups of similarity (e.g., Shaver, Schwartz, Kirson, & O'Connor, 1987), or to directly rate the similarity between pairs of emotion terms. It is an ecologically valid (participants can work with the affective words they use in daily language) and easy-to-use research method (it is an intuitively understandable task that can be easily explained across cultural groups). Both research designs lead to a similarity matrix; within each cell is the number of times that two emotion terms were

sorted in the same group or the average direct similarity score. The observed similarities between the emotion terms are represented as distances between points in a geometrical space by means of multidimensional scaling. This approach has been very popular in Western psychological (e.g., Gehm & Scherer, 1988), cross-cultural psychological (e.g., Russell, Lewicka, & Nitt, 1989), and anthropological research (e.g., Lutz, 1988).

A valence dimension differentiating positively from negatively valenced emotion terms has been identified in all studies that used this approach. There is disagreement, though, about the dimensions beyond valence. Some studies found only a two-dimensional representation (e.g., Church, Katigbak, Reyes, & Jensen, 1998; Russell, 1983; Russell, Lewicka, & Nitt, 1989), while others found a three-dimensional representation (e.g., Fontaine et al., 2002). Moreover, among those studies that found only a two-dimensional representation, there is disagreement about the nature of the second dimension. In some of those studies, the second dimension was an arousal or activation dimension on which high-arousal emotions, such as anger and fear, were differentiated from low-arousal emotions, such as sadness (e.g., Russell, Lewicka, & Nitt, 1989). In other such studies, the second dimension was a power or potency dimension on which emotions such as anger and fear were differentiated (e.g., Gehm & Scherer, 1988; Herrmann & Raybeck, 1981). Those studies in which three dimensions emerged, these three dimensions could be interpreted as valence, power, and arousal (e.g., Fontaine, Poortinga, Setiadi, & Markam, 2002; Shaver, Schwartz, Kirson, & O'Conner, 1987; Shaver, Wu, & Schwartz, 1992).

An important question is what causes these different dimensional representations. A cultural account can be excluded: studies using exactly the same procedure in different cultural and linguistic groups recover the same dimensional structure. For instance, Russell, Lewicka, and Nitt (1989) stably identified the valence–arousal structure across different languages, while Herrmann and Raybeck (1981) stably identified the valence–power structure across linguistic groups; Fontaine et al. (2002) and Shaver et al. (1987, 1992) stably recovered all three dimensions in languages as different as Dutch, English, Italian, Chinese, and Indonesian.

Two methodological factors constitute good candidates to account for the observed differences, namely the selection of emotion terms and the reliability of the similarities (see also Chapter 14). For the first candidate, Russell (1991a) has hypothesized that which of the two dimensions emerges (first) over and above valence depends on the nature of the emotion words included. When more intrapersonal emotion terms are included, an arousal dimension would emerge. When more interpersonal emotion terms are included, a power dimension would emerge. A second likely methodological candidate is the number of participants. The more participants there are, the more reliable the similarity estimations. The studies that worked both with a large sample of emotion terms and a large sample of participants recovered all three dimensions of evaluation, potency, and activation (e.g., Fontaine, Poortinga, Setiadi, & Markam, 2002; Shaver, Schwartz, Kirson, & O'Conner, 1987; Shaver, Wu, & Schwartz, 1992). Studies that worked with a small set of emotion terms and/or with relatively small sample sizes usually found only two dimensions (e.g., Gehm & Scherer, 1988; Herrmann & Raybeck, 1981).

It can be concluded that there is strong evidence for three affective dimensions in the psycholinguistic domain. Those studies that went to great lengths to identify a large and representative set of emotion terms, and that relied on a large sample of participants to compute the similarities, stably found three dimensions. Moreover, the three-dimensional structure of valence, power, and arousal emerges both when participants are asked to rate objects and nouns on a representative set of bipolar adjectives and when participants directly judge emotion terms on their meaning similarity.

Comparing dimensional models of emotion experiences with dimensional models of the meaning of emotion words

In psycholinguistic research, there is thus converging cross-cultural evidence for the three dimensions of valence, power, and arousal. When these psycholinguistic findings are contrasted with the four affect models that dominate self-report research, a highly substantial divergence is observed. The power dimension, which is very important in the psycholinguistic approaches (and is even the second dimension in Osgood's connotative meaning structure), is completely absent in the four most popular self-report models.

A possible explanation for the divergence between psycholinguistic and self-report models lies in the selection of the emotion terms. As discussed previously, Russell hypothesized in 1991 that a power dimension would emerge if more interpersonal emotion terms are sampled and that an arousal dimension would emerge if more intrapersonal emotion terms are included. It could be hypothesized that the most important current affect models work predominantly with intrapersonal affect terms. The fact that Kitayama, Markus, and Kurokawa (2000) have identified a two-dimensional model, which is structured according to the dimensions of valence and what they call "engaged" versus "disengaged" emotions in a cross-cultural context, seems to support this explanation. Within cross-cultural psychology, it is assumed that the interpersonal aspects of the emotional experience are much more salient in non-Western than in Western groups (see also Chapter 3). In developing their emotion instrument, Kitayama et al. carefully represented interpersonal emotions and affects. When these interpersonal affect terms are well represented, the second dimension looks very much like Osgood's power dimension in that anger and pride (disengaged/high power) are opposed to tenderness and shame (engaged/low power). While this observation is suggestive, it has not yet been demonstrated that the three dimensions of valence, power, and arousal can be jointly identified in self-ratings of emotional experiences when a representative set of emotion terms is rated by a large number of participants.

It can thus be concluded that there is converging evidence that valence and arousal both structure the domain of emotional experiences and the meaning of emotion terms. For power, the results are less clear-cut. Power is evidently a dimension in the meaning of emotion terms, next to valence and arousal; it still has to be demonstrated, however, whether power can be identified as a separate dimension in emotional experiences next to valence and arousal (see Chapter 15 for an empirical investigation of this issue).

Labeling the emotion dimensions

Before completing this discussion of dimensional models, the labeling of dimensions should be addressed. As can be seen, the three dimensions have been labeled differently by the various theoretical and empirical traditions. Despite these differences, however, comparable emotion terms are differentiated. The most important labels that have been given to the first dimension are evaluation, valence, hedonic tone, pleasantness, and pleasure. They all refer to the observation that positive emotion terms such as joy and happiness are opposed to negative emotion terms such as sadness, fear, and anger. For the second dimension, the most important labels have been potency, power, control, and dominance. On this dimension, anger terms are opposed to fear and sadness terms. The labels arousal and activation have been the most popular for the third dimension. Fear and anger terms are typically differentiated from sadness terms on this dimension.

Although these labels each carry their particular meanings, which can be important for differentiating them in specific contexts, they have been used interchangeably because they all refer to a common core in each of these dimensions.

For the remainder of this book, the labels *valence*, *power*, and *arousal* will be used. For the first dimension, the label *valence* is preferred because valence can best be used to refer to all aspects of the emotion process. The other labels either strongly focus on the appraisal component (evaluation) or on the feeling component

(hedonic tone, pleasantness, or pleasure). For the second dimension, the label *power* is further used because it best captures potency/strength, control, and dominance, which have been identified as key facets of the second dimension. For the third dimension, the label *arousal* has been chosen. Arousal and activation are often used interchangeably in the literature. However, arousal refers more to the bodily aspect of the emotional process than does activation. As bodily activation is considered a defining aspect of this dimension, we prefer to label this dimension arousal.

2.2 The basic emotion approach

The emotion approach that dominated much of emotion research in the second half of the last century and that has remained influential until today is the basic emotion approach. The key assumption of this approach is that there exists a limited number of qualitatively different, hardwired, and universal emotion processes. It is claimed that these processes are internally coherent and characterized by, for instance, distinctive universal signals (expressive behavior), distinctive physiology, an automatic appraisal focused on distinctive universal antecedent events, and a distinctive subjective experience (e.g., Ekman, 1999). The basic emotion approach can be traced to the ground-breaking work of Charles Darwin on emotions in humans and animals (1872) and has been strongly elaborated in psychology by Tomkins (1962) and later by Izard (1977) and Ekman (e.g., Ekman & Oster, 1979). The most well-known basic emotion theory is that of Ekman (e.g., Ekman, 2003), who postulates the existence of seven evolutionary developed basic affective programs: happiness, surprise, contempt, sadness, fear, disgust, and anger. Much of the research in the basic emotion tradition has focused on the facial and vocal expression of emotions, which are assumed to be hardwired manifestations of the basic emotion process. In the typical research paradigm, participants are shown facial expressions or have to listen to vocal expressions and are then asked to identify the expressed emotion from a list of emotion terms. Using this standard paradigm, it has been demonstrated that the recognition for each presumed basic emotion was above chance level across cultural groups for vocal expression and even more so for facial expression (e.g., Ekman & Friesen, 1971; Scherer, Banse, & Wallbott, 2001).

From the basic emotion approach, emotion terms refer to a limited number of categorically different basic emotion processes. The basic emotion approach thus has a categorical view on the meaning of emotion terms. This view on meaning is often assumed in daily emotion talk and when emotion words are used in psychological research. Within the basic emotion approach, a core set of emotion terms is assumed to have the basic emotions as their referents, and therefore the existence of these terms is expected to be (nearly) universal. Beyond these basic emotion terms, the variability of terms in the emotion lexicon is accounted for by three factors in traditional basic emotion theorizing: intensity, context, and blending (e.g., Fontaine et al., 2002; Plutchik, 2001). The first factor is related to the fact that different intensities of the same basic emotion can have been encoded in language, such as irritation and rage to refer to a low- and high-intensity form of anger. Regarding the second factor, emotion words could imply information about the specific context in which the emotion is experienced. For instance, bliss can be seen as intense joy in a spiritual context. The third factor, blending, follows from the fact that a single situation can elicit more than one basic emotion and that, although basic emotions are qualitatively different processes, their incidence is not mutually exclusive. Emotion terms could thus refer to blends of basic emotions, such as distress, which shares properties of sadness and fear. Thus, according to the basic emotion approach, a distinction can be made between two types of emotion words: emotion words that have a basic emotion as their referent and emotion words that qualify the basic emotion in terms of intensity, context, or blending with other basic emotions. In more recent basic emotion theorizing, other types of non-basic emotional phenomena are also allowed for, for instance on the basis of emotion schemas that are culturally and developmentally more malleable (e.g., Izard, 2007).

The assumption that the emotion lexicon is organized around basic emotion terms has been psycholinguistically investigated in conjunction with Rosch's natural language theory (Rosch, 1973a, 1978) (see

also Chapter 1). According to this theory, natural language categories are organized hierarchically in a superordinate, a basic, and a subordinate level of categorization. These three levels differ in terms of informativeness and cognitive economy. A high level of categorization is economical, as only a few words are needed to categorize a domain, but it is not very informative (e.g., the category mammal). The basic level of categorization has an optimal trade-off between informativeness and cognitive economy (e.g., the category of cats or dogs). A lower-level category is very informative, but not cognitively economic, as many terms are needed to categorize a domain (e.g., a golden retriever). As the basic level offers the best trade-off between informativeness and cognitive economy, basic categories are encoded in language by single and typically short words, which come to mind first when someone is asked to categorize an object, and are learned first in language acquisition. When Rosch's natural language theory is applied to emotions, it is assumed that the basic emotions correspond to the basic level of categorization. In line with this assumption, it has been observed that terms for presumably basic emotions are almost universally found across cultural groups and languages (with some exceptions, Russell, 1991; Chapter 3). As predicted by Rosch's natural language theory, these basic emotion words are mostly encoded by single and short words and come to mind first (e.g., Fehr & Russell, 1984). Moreover, these basic emotion words are learned first by children (e.g., Bretherton & Beeghly, 1982). Although not yet empirically confirmed, these observations raise the expectation that emotion words for the basic emotions have a much more stable meaning, both within and across cultures, than do the other emotion words that qualify the basic emotions in terms of intensity, context, or blending.

The empirical investigation of the hierarchical structure in the emotion domain relies on exactly the same similarity sorting or rating procedures as those that are used by the dimensional approaches. However, instead of representing the similarities in a dimensional space by means of multidimensional scaling, the similarities are represented categorically by means of hierarchical cluster analysis (e.g., Shaver, Schwartz, Kirson, & O'Connor, 1987). Applying hierarchical cluster analyses to similarities between emotion terms reveals four clusters that stably emerge across languages and cultural groups: joy, anger, sadness, and fear (see, for instance Figure 2.2 from a study in The Netherlands by Fontaine et al., 2002). Depending on the sample and the language, more clusters can emerge. For instance, it was found that instead of one broad joy cluster, a more narrow joy cluster and a love cluster emerged in the US (Shaver et al., 1987), Italy (Shaver, Wu, & Schwartz, 1992) and Canada (Storm & Storm, 1987). In the US and Italy, a separate surprise cluster emerged (Shaver et al., 1987; Shaver et al., 1992). In China, a separate shame and a separate sad love cluster emerged (Shaver et al., 1992). These other clusters, however, are not replicable across samples and languages. Thus, when it comes to meaning, the basic emotion approach has revealed at least four universal basic emotion clusters, joy, sadness, anger, and fear.

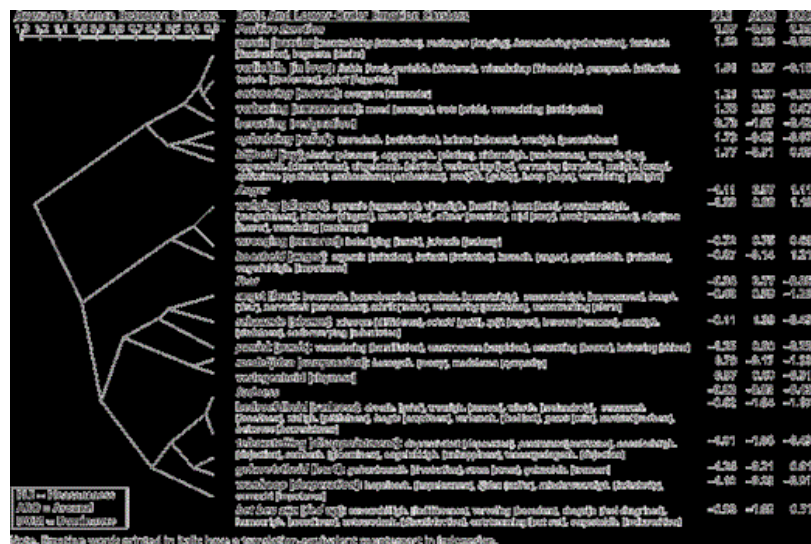


Figure 2.2 Hierarchical cluster analysis on 120 Dutch emotion terms and cluster position in a three-dimensional space.

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2.3 The componential approach

One of the most striking characteristics of the emotion domain is its variability in theoretical approaches. These theoretical approaches not only differ in their view on how emotions function, but they vary even more with respect to the very phenomena that are at the center of their theorizing. Some approaches focus on psychophysiological changes, in line with the theorizing of William James, who defined emotion as the awareness of bodily changes (e.g., James, 1894). Building on Darwin's evolutionary approach to emotions (Darwin, 1872), many emotion theorists have focused on facial and vocal expressions (e.g., Ekman & Oster, 1979; Izard, 1977). Others have treated feelings as key to the emotion-related processes (e.g., the core affect theory of Russell, 2003). Furthermore, motivational changes that have precedence in ongoing behavior have been proposed as the essence of emotions (Frijda, 1986). Still other theorists have built on the early work of Arnold (1960) and have focused on the cognitive basis of emotion. In this view, cognitive appraisal of the emotional situation is seen as the driving force for the emotion processes (e.g., Lazarus, 1991a; Roseman, 2001; Scherer, 2001).

The componential emotion framework, of which the Component Process Model presented in the previous chapter is a typical example, proposes an integrative framework for the diversity of empirical phenomena that have been studied under the umbrella of the emotion concept. According to this framework, an emotion is not a specific state or any one type of phenomenon, but a process in which these different phenomena interact in a coordinated fashion. The componential emotion framework proposes that these phenomena refer to basic subsystems of human functioning (named components) that start to interact in a coordinated way in goal-relevant events in order to prepare the person for adequate action.

The aim of the research program of the componential emotion framework is to identify the number and nature of features in each component and how they interact in a coordinated way in goal-relevant events. For instance, Scherer and Wallbott (1994) identified feeling, physiological, and motor expression profiles from daily experienced episodes of each of seven emotions in 37 countries. Another example is the study of Frijda, Kuipers, and ter Schure (1989), who studied how 23 appraisal dimensions relate to 29 action tendency dimensions for 32 emotional states.

The componential emotion approach is characterized by a *feature profile view* of the meaning of emotion terms. That is, it decomposes the meaning of an emotion term into a profile of features. This feature profile view has received little attention in psycholinguistic studies. A notable exception is the work of Tzeng, Hoosain, and Osgood (1987), who investigated the denotative meaning of 22 emotion concepts in 23 cultural groups by identifying their respective feature profiles with regard to 10 features: pleasantness, activation, control, ego orientation, cognitivity, overtiness, dominance, time orientation, terminality, and sociality. These features were especially selected from the cognitive approach to emotion, which, according to Tzeng et al. (1987), defined an emotion word denotatively. The researchers asked experts in the 23 cultural groups to rate each of the 22 emotion concepts on these 10 features. They observed that the feature profiles were stable across cultural groups and could differentiate the 22 emotion concepts. Despite its innovative character and its extensiveness, this study had no impact on the psycholinguistic study of the meaning of emotion words.

The GRID paradigm, which was introduced in the previous chapter and was developed independently from the research of Tzeng et al. (1987), can be considered as a further elaboration of their feature profile approach. It differs from their approach with respect to the selection of the features. Whereas Tzeng et al. (1987) selected their features on the basis of the cognitive approach to emotion, the GRID paradigm is rooted in the componential emotion approach. In this approach, an emotion corresponds to a process elicited by goal-relevant events in which several components interact in coordinated ways. Thus, according to the GRID paradigm, the features of each of these emotion components, which change in response to goal-relevant events, are needed to convey the denotative meaning of an emotion word.

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2.4 The incompatibilities and compatibilities between the dimensional, the basic emotion, and the componential emotion approaches

Incompatibilities. At first sight, the dimensional, the basic emotion, and the componential emotion approaches are incompatible, both with respect to the processes that they propose to account for the emotional phenomena, and with respect to their views on what constitutes the meaning of an emotion term. From a theoretical point of view, the dimensional and the basic emotion approaches conflict. The affective experience, which continuously varies in a two-dimensional space, forms the essence of the emotion construct according to the dimensional approach (e.g., Russell's core affect theory, Russell, 2003). All the other phenomena that are studied in the emotion domain can become associated with, can be affected by, or can affect this continuous affective experience. From the basic emotion approach, though, the essence of the emotion domain consists of a limited number of qualitatively different affect programs.

The dimensional approach also conflicts with the componential emotion approach. The former puts the two-dimensional affective experience at the heart of emotion (e.g., Russell, 2003). According to the latter, the (possibly dimensional) affective experience is considered as an outcome of coordinated activity between emotion components in response to goal-relevant events. The emotion process is only brought to consciousness in order to facilitate the regulation of the process (e.g., Scherer, 2009).

The views in the basic emotion approach also conflict with those in the componential emotion approach. According to the basic emotion approach, there exist a few qualitatively different affect programs that determine the emotion domain, while the componential emotion approach assumes that patterns of appraisals with respect to ongoing events will drive an appropriate synchronized activity in all emotion components (cf. previous chapter).

In line with these different presumed processes, these three approaches also have different views on how the meaning of an emotion word has to be defined. The meaning of an emotion term is defined by a set of

coordinates on a small number of dimensions (dimensional approach), by a reference to one or more internally coherent affect programs (basic emotion approach), or by a pattern of features representing the activity in each of the emotion components (componential approach).

Moreover, there is still another important source of incompatibility between the dimensional approach on the one hand, and the basic emotion and componential emotion approach on the other hand, with respect to the terms that belong to the domain of investigation. The dimensional approach works with a much more extensive domain of reference than the two latter approaches. All terms that are studied from the basic emotion and feature profile approaches qualify in principle for the dimensional approach as well (such as joy, anger, sadness, and fear). The reverse, however, is not necessarily true. Many dimensional models make abundant use of terms such as “sleepy,” “strong,” and “jittery,” which are not considered bona fide emotion terms by many researchers. They neither refer to a basic emotion (or a combination of basic emotions), nor to coordinated activity in the different subsystems of the human organism. These terms can be considered feeling terms that describe the general quality of the emotional experience, rather than emotion terms. The three approaches of meaning can only be directly investigated in relationship with one another with respect to the same domain of reference, that is, only on the basis of emotion words that belong to the domain of reference for the three approaches.

Compatibilities. Although the views on the underlying emotion processes are certainly different and in many respects even conflict with one another, the information that these approaches do reveal or can reveal about the meaning of emotion terms is not incompatible. While each of these approaches has its own favorite focus of research (subjective experiences for the dimensional approach, facial and vocal expression for the basic emotion approach, and appraisals for the componential approach), they are not restricted to it. The three approaches do agree, in general, that cognitive (appraisal), psychophysiological (bodily reactions), motivational (action tendencies), expressive (facial, vocal, and gestural expressions), and experiential (feelings) aspects are all phenomena that are to be investigated within the emotion domain. Thus, empirical evidence on how these phenomena are related is relevant across emotion approaches.

Moreover, although the views about what constitutes meaning seem incompatible, the empirical investigation of meaning from these different approaches is perfectly compatible. This has already been demonstrated for the dimensional and basic emotions approaches. In psycholinguistic research, both approaches work on the same data, that is, with perceived similarities between emotion terms. Depending on the theoretical approach, the same data are represented differently. From a dimensional approach, multidimensional scaling is applied, and the emotion words are represented as points in a geometrical space. From the basic emotion approach, cluster analysis is applied and the similarities are represented by hierarchically organized categories. These two representations are perfectly compatible, as they are based on the same similarity data. Moreover, there is a mathematical relationship between both representations, as any set of K points can be represented in a $K-1$ dimensional space. In line with this relationship, it has been observed that the four replicable basic emotion clusters are systematically differentiated in a three-dimensional space, with the joy cluster being opposed to the other three clusters on the first dimension, the anger cluster being opposed to the fear and sadness cluster on the second dimension, and the sadness cluster being opposed to the anger and fear cluster on the third dimension (e.g., Fontaine, Poortinga, Setiadi, & Markam, 2002; Shaver, Schwartz, Kirson, & O’Conner, 1987; Shaver, Wu, & Schwartz, 1992) (see Figure 2.2 for an example). It has thus already been well established in the empirical literature that the dimensional and the basic emotion approaches offer two complementary representations of meaning in the emotion domain.

Although not yet empirically validated, the study of meaning from the componential emotion approach is perfectly compatible with the study of meaning from the dimensional and the basic emotion approaches. From the componential emotion approach, an emotion term is characterized by a specific feature profile that represents the typical coordinated activity in each of the components for that emotion. These feature profiles also allow computation of similarities between pairs of emotion terms. Profile similarities can be computed

and these profile similarities can either be dimensionally represented using multidimensional scaling, or can be categorically represented using hierarchical cluster analysis. Thus, a feature profile representation, a categorical representation, and a dimensional representation of the meaning of emotion terms are just alternative representations of the same data and are compatible.

It can be concluded that although the underlying emotional mechanisms proposed by the three theoretical approaches are substantially different (and in many respects incompatible), the three approaches are compatible when it comes to the meaning of emotion terms, at least for those terms that belong to the more narrow category of emotion terms. The same data can be represented in different ways, depending on the specific emotion approach. This means that the GRID paradigm, which is rooted in the

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componential emotion approach and which was presented in the previous chapter for studying the meaning of emotion terms, can be directly linked to the meaning of emotion terms from the dimensional and basic emotion approaches. The expected links are presented in the last part of this chapter.

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2.5 The GRID paradigm and the psychological perspective on meaning

The essence of the GRID paradigm is the feature profile approach to meaning. The GRID paradigm proposes to identify the meaning of emotion terms through the profile of features that describe the emotion process according to the Component Process Model (Scherer, 2005a, 2009c, Chapter 1). The GRID paradigm should not, however, be restricted to identifying the profiles that define the meaning of each emotion term. The GRID paradigm also allows one to take a dimensional and a basic emotion approach at the same time. Compared to these existing psycholinguistic approaches to the meaning of emotion terms, the GRID paradigm makes explicit the very features on the basis of which emotion terms are related to one another. Thus, if the Component Process Model indeed identifies the features that define the psychological meaning of emotion terms, the GRID paradigm makes explicit the basis of the perceived similarities between emotion terms. Under that condition, the profile similarities derived from the component features will be highly comparable with the perceived similarities between emotion terms collected through similarity tasks. It can then be expected that a categorical representation on the basis of the feature-based similarities will also generate the four major clusters of joy, anger, fear, and sadness terms, and that a dimensional representation of these feature-based similarities will also generate the three dimensions of *valence*, *power*, and *arousal*. Thus, although the GRID paradigm is rooted in one particular theoretical model, the Component Process Model, it is useful for all three meaning approaches to emotion words. At the level of meaning, it does not contradict the fundamental assumptions of the other two approaches. Rather, it can help to provide a better understanding regarding the source of the perceived similarities between emotion terms as they have been observed in the dimensional and basic emotion approaches.

Notes

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