



Components of Emotional Meaning: A sourcebook

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CHAPTER

1 Measuring the meaning of emotion words: A domain-specific componential approach

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Abstract

It is suggested that the features of the meaning of all emotion words must be determined by the specific nature of emotion as a biopsychosocial phenomenon and that thus the nature and definition of emotion need to be clarified first. After exploring three potential theoretical frameworks, a componential framework in the form of the Component Process Model of emotion (CPM) is presented. Specifically, the issue of the number of different emotions and their categorization and labeling is discussed, including underlying mechanisms. Following Austin, it is suggested that folk concepts of emotion are built into the semantics of the labels, reflecting a process of lexical sedimentation of emotional experience. Based on the notion of design features, the emotion-specific GRID paradigm is proposed, operationalizing word meanings by feature profiles encompassing all components of the emotion construct.

Keywords: [emotion definition](#), [componential approaches](#), [component process model](#), [design features](#), [lexical sedimentation](#)

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

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First, words are our tools, and, as a minimum, we should use clean tools: we should know what we mean and what we do not, and we must forearm ourselves against the traps that language sets us. Secondly, words are not (except in their own little corner) facts or things: we need therefore to prise them off the world, to hold them apart from and against it, so that we can realize their inadequacies and arbitrariness, and can relook at the world without blinkers. Thirdly, and more hopefully, our common stock of words embodies all the distinctions men have found worth drawing, and the connexions they have found worth marking, in the lifetimes of many generations: these surely are likely to be more numerous, more sound, since they have stood up to the long test of the survival of the fittest, and more subtle, at least in all ordinary and reasonably practical matters, than any that you

or I are likely to think up in our arm-chairs of an afternoon – the most favoured alternative method
(Austin, 1956 , p. 8).

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Austin's famous quote about the world knowledge being embodied in ordinary language words is often cited as a justification for the lexical approach to personality (often referred to as the lexical sedimentation hypothesis; John, Angleitner, & Ostendorf, 1988; Saucier & Goldberg, 1996). In fact, very early on, a pioneer of personality assessment made the assumption "that all aspects of human personality which are or have been of importance, interest, or utility have already become recorded in the substance of language. For, throughout history, the most fascinating subject of general discourse, and also that in which it has been most vitally necessary to have adequate, representative symbols, has been human behavior" (Cattell, 1943, p. 483). Given the importance of emotion in human social interaction, as well as in literature, this is equally true for the emotion domain. In consequence, it seems largely justified to adopt a lexical approach and to examine the lexical sedimentation hypothesis for emotion words in ordinary language. Assuming that language primarily serves social communication, the question is, what elements of meaning must be present in the emotion lexicon to serve the function of reliably and accurately conveying the emotional reactions of individuals to significant events and their behavioral intentions?

Adopting this approach requires, if one takes Austin's caveats literally, that we should know exactly what we mean by the word "emotion" and by the different emotion words in ordinary language and that we have to prise them off the phenomenon, and hold them apart from, and against it. This is exactly what we propose to do in this book, contrary to the general tendency of taking emotion words as a given in emotion research, a tendency that transcends all theoretical traditions in this domain.

The starting point for the approach advocated here is that the features of the meaning of all emotion words must be determined by the specific nature of emotion as a biopsychosocial phenomenon. In consequence, first the nature of "emotion" is examined in order to determine the constitutive aspects of this joint characteristic of meaning in emotion terms. This will serve as a baseline to explore the specific meaning of words for specific tokens of the general type "emotion," as well as to investigate ways to measure and represent this meaning. To this effect, three potential theoretical frameworks are explored and, as a componential framework is judged to be most promising for the task, the architecture of the Component Process Model of emotion (Scherer, 2001, 2009a) is presented. The question concerning the number of different emotions and the role of emotion words in categorizing them is then breached, including a consideration of the underlying mechanisms. This is followed by an argument for using, following Austin, emotion words in ordinary language, to learn more about the folk concepts of emotion built into the semantics of these labels. Finally, encouraged by the ideas of design feature analyses, the GRID paradigm is proposed, which is specific for the emotion domain and operationalized by feature profiles encompassing all components of the emotion construct.

1.1 What is an emotion?

Ever since William James rhetorically asked this question in 1887, his answer and many alternative suggestions have been hotly debated. After more than a century of debate, there is still no consensus on a scientific definition of the phenomenon under discussion or on questions such as: How many emotions are there? Are some more basic than others? Are there natural kinds? Should they be represented as regions in dimensional space rather than discrete categories? The amount of discord between emotion scholars is surprising, as the basic facts are uncontroversial: There are certain types of events or situations (such as loss, frustration, danger, success) that tend to elicit specific affective responses in organisms. These responses are characterized by physiological changes (in cardiovascular activity, blood flow, respiration, temperature, and muscle tension); expressions in the voice, face, and body (such as laughing, crying, shouting, gesticulating, and cringing); and shifts in behavioral intention and direction. The life episodes characterized by such response patterns to salient events, generally, produce a conscious feeling of a particular quality in the person concerned that constitutes a unitary experience over a certain period of time. Importantly, these episodes and the associated experiences can be, and often are, labeled with a specific word, a brief expression, or a metaphor, both by the experiencing person and by observers. Such expressions exist in all languages of the world and generally show sufficient translational equivalence to allow intercultural communication.

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Frijda and Scherer (2009) have attempted to summarize the constitutive features of a definition of emotion that seem to be shared by a majority of emotion theorists and researchers in different disciplines: 1) Emotions are elicited when something relevant happens to the organism, having a direct bearing on its needs, goals, values, and general well-being. Relevance is determined by the appraisal of events on a number of criteria, in particular the novelty or unexpectedness of a stimulus or event, its intrinsic pleasantness or unpleasantness, and its motivational consistency, that is, its conduciveness to satisfy a need, reach a goal, or uphold a value, or its “obstructiveness” to achieving any of those (Scherer & Ellsworth, 2009; Scherer, 2001). 2) Emotions prepare the organism to deal with important events in their lives and thus have a strong motivational force, producing states of action readiness (Frijda, 2007a). 3) Emotions engage the entire person, urging action and/or imposing action suspension, and are consequently accompanied by preparatory tuning of the somatovisceral, and motor systems. This means that emotions involve several components, subsystems of the organism that become synchronized to different degrees during the emotion episodes, maximizing the organism’s capacity to adapt to the contingencies of the situation (Scherer, 2001, 2005a). 4) Emotions bestow control precedence (Frijda, 2007a) on those states of action readiness, in the sense of claiming (not always successfully) priority in the control of behavior and experience.

The authors argue that it is these four central features that jointly define what is generally meant by emotion, both in lay and scientific terminology. From these considerations, emotion can be defined as a *bounded episode* in the life of an individual that is characterized as an emergent pattern of *synchronization between changing states of different subsystems* of the organism (which are considered as components of the emotion), preparing *adaptive action tendencies to relevant events* as defined by their behavioral meaning (as determined by recurrent appraisal processes), and thus having a *powerful impact on behavior and experience*. This definition provides a working hypothesis for a meaning feature set that is common to all emotion words and is capable of distinguishing emotions from other affective states such as preferences, moods, attitudes, interpersonal stances, and affective dispositions (Scherer, 2005a, 2009c). In other words, if someone is described with an emotion adjective (e.g., angry, sad, fearful), this means that the person has evaluated an event, behavior, or situation as being relevant for his/her well-being or goal attainment, and that an appropriate action readiness or behavioral tendency has been prepared through synchronized changes in different mental and somatic subsystems (with a sizable effect on the person’s experience and behavior).

More recently, Mulligan and Scherer (2012) have proposed an argued list of elements for a working definition of emotion, justified by the inclusion of elements from philosophy and psychology. Concretely, they propose the following working partial definition:

X is an emotion only if X is an affective episode, which has the property of intentionality (i.e., of being directed), AND contains bodily changes (arousal, expression, etc.) that are felt, AND contains a perceptual or intellectual episode, Y, which has the property of intentionality (the intentionality of X being inherited from the intentionality of Y), AND is triggered by at least one appraisal, AND is guided by at least one appraisal.

p. 10 While one perceives increasing convergence on these central elements of a definition of emotion, and thus presumably also on the shared semantic features of the class of emotion terms, there is disagreement about the precise set of terms that references affectively charged states in the widest sense and that should be included in the class of bona fide emotion words. Thus, whereas joy, anger, sadness, and fear are included in everybody's emotion list, this is not the case for interest, ↳ regret, amusement, or stress. The reason is that scholars disagree about the extent to which the central design features of emotion, as outlined above, apply to the states or episodes referenced by the respective words (for example: Is there a relevant object in "contentment"? Do physiological changes occur in "guilt"? Is an action tendency produced in "joy"?). The answer to the question as to how many different emotions there are depends on basic theoretical assumptions about the mechanisms underlying emotion elicitation and differentiation. In consequence, we need to first briefly survey the assumptions made by different emotion theorists.

1.2 Theories of emotion

While there are many types of emotion theories (Moors, 2009; Scherer, 2009b), three major currents can be identified—basic emotion, dimensional/constructivist, and appraisal theories. These theories differ with respect to the definition of the basic units of emotional experience, the underlying mechanism that is assumed, and the role of the verbal emotion labels in ordinary language in relation to the psychobiological emotion process. *Basic (or discrete) emotion theories* have been developed in the wake of Darwin's (1872/1998) pioneering work on the expression of emotion, in particular by Tomkins (1962), Ekman (1972, 1984), and Izard (1977, 1992). These theorists postulate clearly separated categories of emotions, assuming that specific types of events trigger specific affect programs corresponding to one of a limited number of basic emotions, and producing characteristic expression patterns and physiological response configurations. More recently, both Ekman (1999) and Izard (2007) have modified their earlier accounts by emphasizing the flexibility of the emotion system, the difference between basic and complex (or primary and secondary) emotions, the influence of sociocultural context, and the interactions of different emotion components. The discrete categories of basic emotions and their expression programs are referred to by distinctive labels (although variations within emotion families are acknowledged; Ekman, 2003).

Dimensional/constructivist emotion theories have emerged from the confluence of two different traditions. The dimensional aspect was pioneered by Wundt (1905) who, based on introspection, proposed that feelings varied in three dimensions—valence (positive–negative), arousal (calm–excited), and tension (tense–relaxed). These three dimensions have been further developed, in modified forms, to show the dimensionality of facial expressions (Schlosberg, 1954), dimensions of semantic meaning (Osgood, Suci, & Tannenbaum, 1957), and the similarity structure of feelings (Russell, 1980). The constructivist bend took its origin in William James’ claim “that the bodily changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur is the emotion” (James, 1884, p. 190), which has led to a “century of debate” (Ellsworth, 1994). To counter some of the opposition to James’ theory, Schachter and Singer (1962) proposed a two-factor theory in which increased arousal (the first factor) is perceived by an individual as requiring an explanation that is generally achieved by a cognitive analysis of context features (the second factor), resulting in a differentiated feeling state. More recently, Russell (2003) suggested that the first factor is not just arousal, but a valence by an arousal composite (core affect), with the second factor, as in Schachter/Singer’s case, consisting of cognitive categorization. Barrett (2006a) adopted this position, but proposes a variant that assumes that core affect is differentiated by a “conceptual act,” which constitutes the emotion. In this theoretical tradition, emotional experience is seen as being organized in low-dimensional spaces, rather than in discrete categories. Little effort is made to propose concrete mechanisms for the elicitation and differentiation of emotional experience. Most importantly for the purposes of this book, the emotion words in ordinary language are seen as belonging to a separate sociocultural domain, being “constructively” applied by each individual on the basis of a myriad of motivational and situational factors.

p. 11 *Appraisal theories of emotion* are deeply rooted in philosophical traditions. Aristotle, Descartes, Spinoza, and Hume have all assumed that the major emotions (as indexed by the respective words in the language) are differentiated by the type of evaluation or judgment a person makes of the eliciting event. The recent history of establishing the term *appraisal* as the central constitutive of the approach started with Arnold (1960) and Lazarus (1968) and was further developed in the early 1980s (see Schorr, 2001; Scherer, 1999a). Ellsworth and her students (Smith & Ellsworth, 1985; Roseman, 1991; Roseman & Smith, 2001) and Scherer (1982, 2001, 2009a) independently developed theories suggesting that people’s subjective *evaluation or appraisal* of the significance of events for their well-being and goal achievement elicits the emotion process, and determines the response patterning. Despite large conceptual overlap, different appraisal theorists have proposed divergent accounts of the temporal organization of appraisal checks, and the nature of the underlying mechanism, as well as the nature of valence appraisal, the number and nature of emotion categories, including emotion blends, and the role of consciousness (Grandjean, Sander, & Scherer, 2008).

Several other theorists share some of the major assumptions of appraisal theories, but differ in scope, focus, or underlying architecture: Weiner (1985) stresses the attribution of agency and control; Ortony, Clore, and Collins (1988) focus on the cognitive or situational structure of emotion concepts; Oatley and Johnson-Laird (1987) highlight the evaluation of current goal states on non-propositional and propositional levels of representation; and Frijda (1986, 2007a) considers “action readiness” and the meaning and function of motor response processes as the defining core of emotional response.

With respect to the units of emotional experience, appraisal theories occupy a middle ground. They acknowledge the existence of discrete categories, but do not see them as rigidly defined and constrained as basic emotion theories. They also acknowledge the existence of dimensions of emotional experience, but see the dimensions as emerging from the underlying categorical organization, a mapping of the huge diversity of emotional experiences into a lower-dimensional space. Contrary to the other two positions, appraisal theories give precedence to an elaboration of the mechanisms that govern the elicitation and differentiation of the emotions, in particular the appraisal of relevant events, generating testable hypotheses. They see the labeling of emotional experience by ordinary language words as being intimately tied to the emergent patterns of appraisal and responses characterizing specific emotion episodes.

The differences among the three theoretical traditions can be summarized as follows. The basic emotion model is deterministic on a macro level—a given stimulus or event will determine the occurrence of one of the basic emotions (through a process of largely automatic appraisal). In contrast, appraisal theories are deterministic on a micro level—specific appraisal results or combinations thereof are expected to determine, on a more molecular level, specific action tendencies and the corresponding physiological and motor responses. Most importantly, appraisal theorists espouse emergentism (in the sense of John Stuart Mill); they assume that the combination of appraisal elements in a recursive process unfolding over time, and the ensuing reactions, will form emergent emotions that are more than the sum of their constituents and more than instantiations of rigid categories. As one might expect, constructivist theorists shun determinism in any shape or form and generally espouse a more ideographic than nomothetic model of science (Scherer, 2010a).

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Which of these theories is best suited to guide investigations into the meaning of emotion terms? A central concern is the presumed number and type of emotions. On one extreme, we find the notion of a limited number of evolutionarily continuous adaptive emotion systems (held by many basic emotion theorists) and on the other, that of fuzzy, unpredictable state changes that achieve coherence only by their place in a valence/arousal space and by conceptual classification, as espoused by some constructivists. In this debate, appraisal theorists are somewhere in the middle—they accept neither the idea of a limited repertoire of basic, homogeneous emotions with highly prototypical characteristics, nor the idea of emotions being individually labeled points in two-dimensional affect space. Rather, while assuming that there are widely varying types of emotions, they postulate the existence of modal emotion families (Scherer, 1994) with typical, frequently occurring appraisal profiles that have adaptive functions in dealing with quintessential contingencies in animal and human life.

This approach seems well suited to conceptually and empirically address the issue of the development of fuzzy emotion categories and the corresponding lexical labels in different languages and cultures, as well as the construction of a framework to compare the respective semantic fields. Before dealing specifically with this issue, one of the appraisal theories, the component process model (CPM) of emotion, will be described in more detail, with specific emphasis on the categorization and labeling of felt experience. This discussion will highlight the importance of different components of emotion and their synchronization toward a certain degree of coherence that defines the emotion episode, a dynamic process rather than steady state.

1.3 The component process model (CPM) of emotion mechanisms

The CPM is based on the conjecture that during evolution, emotion replaced instincts in order to allow for more flexible responding to events in a complex environment, and it did so by introducing an interruption into the stimulus-response chain to allow for more ample information processing. It also contends that emotion has been optimized to serve the following functions: (a) evaluation of objects and events, (b) system regulation, (c) preparation and direction of action, (d) communication of reaction and behavioral intention, and (e) monitoring of internal state and organism–environment interaction (see Scherer, 2001). Specifically, the model suggests that efferent effects of sequentially accrued appraisal results cumulatively constitute the unique, context- and individual-specific response pattern for a given emotion episode.

p. 13 Figure 1.1 shows the basic architecture of the model, highlighting the dynamic, recursive emotion processes following an event that is highly pertinent to the needs, goals, and values of an individual. Briefly put, the CPM suggests that the event and its consequences are appraised with a set of criteria on multiple levels of processing, producing a motivational effect or action tendency that often changes or at least modifies the status quo. Specifically, the appraisal results and the concomitant motivational changes will produce efferent effects in the autonomic nervous system (in the form of somatovisceral changes) and the somatic nervous system (in the form of motor expression in face, voice, and body). All of these components, appraisal results, action tendencies, somatovisceral changes, and motor expressions are centrally represented and constantly fused in a multimodal integration area (with continuous updating as events and appraisals change). Parts of this central integrated representation may then become conscious and subject to assignment to fuzzy emotion categories, as well as being labeled with emotion words, expressions, or metaphors. Given the interdisciplinary nature of this volume, the following section provides only a brief outline, restating some of the major elements of the theory based on the earlier publications. More detailed treatments of these issues can be found elsewhere (Scherer, 2001, 2004a, 2009a).

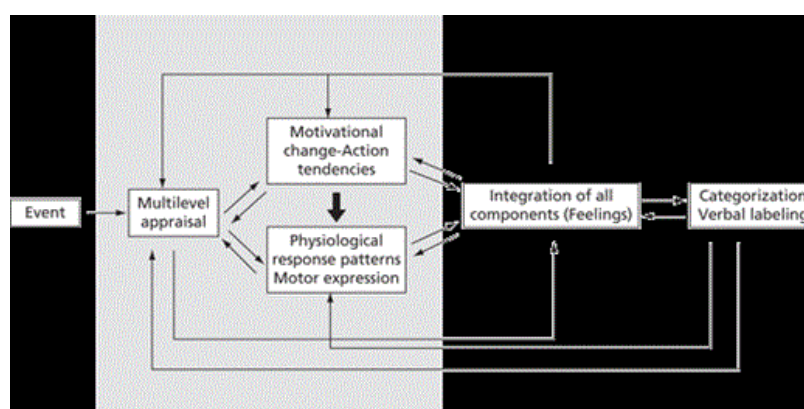


Figure 1.1 The dynamic architecture of the Component Process Model.

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The nature of the appraisal process

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The CPM proposes that the organism evaluates events and their consequences on a number of appraisal checks, with the results reflecting the organism's subjective assessment of consequences and implications on a background of personal needs, goals, and values (which may well be unrealistic or biased). Figure 1.2 shows the processes within the gray-shaded panel in Figure 1.1 in greater detail. In particular, the horizontal panel labeled "Appraisal processes" shows the different groups of appraisal criteria (with the individual checks within the respective group) organized in the theoretically expected sequence (see Scherer, 2001, 2009a), together with the respective cognitive structures that are recruited in these appraisal processes (with the downward-directed arrows representing the input of the different cognitive structures into the appraisal process, e.g., retrieval of past experiences of a similar kind from memory, and the upward-directed arrows representing a modification of the current content of these structures by the appraisal results, e.g., attention being redirected by a relevance appraisal). The horizontal panels below the appraisal level show three response components and the final integration of all changes in the feeling component. The bold downward-directed arrows illustrate the central assumption of the model in each phase of the process: the appraisal results sequentially and cumulatively affect all response domains. The dotted upward-directed arrows represent the changes induced in this fashion (which are fed back to the appraisal module and the cognitive structures subserving and regulating the appraisal process). The appraisals are expected to unfold sequentially over time. Each type of assessment receives input from other cognitive and motivational mechanisms, such as attention, memory, motivation, reasoning, and the self-concept, which provide stored information and evaluation criteria that are essential for the appraisal process. Further details of the specific appraisal criteria or checks are provided in the next section of this chapter.

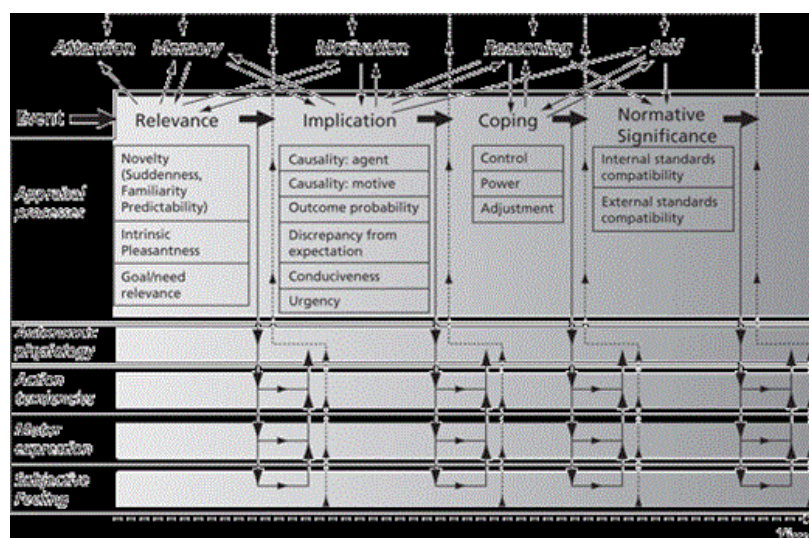


Figure 1.2 Schematic summary of the Component Process Model.

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1.4 Appraisal criteria

The outline of the appraisal criteria provided below is based on Scherer's CPM (Scherer, 2001, 2009a), but there is a great deal of overlap with other appraisal theories that have proposed a set of criteria or dimensions for appraisal (see Ellsworth & Scherer, 2003; Roseman & Smith, 2001; Scherer, 1999a). The appraisal checks are grouped into four functional classes: detection of the relevance of an event, inference of the probable implications or the consequences of an event for oneself, determining one's potential or power to cope with these consequences, and an evaluation of the normative significance of the event (i.e., its compatibility with social values and one's self-image).

Relevance detection

Novelty check. At the most primitive level of sensory-motor processing, any sudden stimulus (characterized by abrupt onset and relatively high intensity) is likely to be registered as novel and deserving attention. Beyond this low-level detection of novelty or suddenness, the assessment of novelty may vary greatly for different species, individuals and situations, and may depend on motivational state, prior experience with a stimulus or expectation. One of the most important mechanisms might be matching it to schema to determine the degree of familiarity with the object or event. On a still higher level of processing, the evaluation of novelty is likely to be based on complex estimates of the probability and predictability of the occurrence of a stimulus.

Intrinsic pleasantness check. It is of central relevance for an organism to determine whether a stimulus event is likely to result in pleasure or pain (in the widest sense). Intrinsic pleasantness is a feature of the stimulus and, although preference for certain stimuli may have been acquired from previous experience, the momentary state of the organism is not central to the check. In contrast, the evaluation of stimuli that help to reach goals or satisfy needs (see goal relevance check below) depends primarily on the relationship between the significance of the stimulus and the organism's motivational state.

p. 15 **Goal relevance check.** This check establishes the relevance, pertinence, or importance of a stimulus or situation for the momentary hierarchy of goals/needs. A stimulus is relevant for an individual if it results in outcomes that affect major goals/needs. Relevance is likely to vary continuously from low to high, depending on the number of goals/needs affected and their relative status in the hierarchy. For example, an event is much more relevant if it threatens one's livelihood or survival than if it just endangers one's need to listen to a piece of music.

Implication assessment

Causal attribution check. One important factor in determining the potential implications or consequences of an event is to determine who or what caused it. This is of course a subjective evaluation, which is the reason for the term causal attribution (phenomena studied in much detail by attribution theory; Weiner, 1985). The important issues concern the responsibility for causing the event, that is, the agent who brought it about, which means attributing responsibility to oneself, another person/other persons, or supernatural powers. It is also possible that no agent can be identified, leading to an attribution of chance occurrence. Another important issue is to determine whether the likely agent has caused the event inadvertently or intentionally, as this will have an impact on potential implications (for example, if someone wants to hurt me intentionally, it is likely that he or she will persist).

Outcome probability check. Some types of events, such as the death of a close person, have fairly predictable implications and the probability of specific consequences can be established with certainty (i.e., no further interactions are possible, the relationship ends). In other cases, the implications might be much more difficult to determine. Thus, it is difficult to determine what the ulterior consequences of a sudden drop in the stock market are for the development of my portfolio—the probability of further losses, or potential recovery, are difficult to assess.

Discrepancy from expectation. In most cases, we have specific expectations as to what kinds of outcomes we expect at certain points in a goal-plan-action sequence, either because of our own behavior or because of our prior knowledge of the evolution of certain events. Thus, specific outcomes of an event can be more or less congruent or discrepant with what we expected at this point in time.

Goal/need conduciveness check. Most importantly, the organism needs to check the conduciveness of a stimulus event to help attain one or several of the current goals/needs. The consequences of acts or events can constitute the attainment of goals/needs, or progress toward attainment, or facilitate further goal-directed action (see Oatley & Duncan, 1994). The more directly that the outcomes of an event facilitate or help goal attainment and the closer they propel the organism toward reaching a goal, the higher the conduciveness of an event.

Urgency check. Adaptive action in response to an event is particularly urgent when high priority goals/needs are endangered, and the organism has to resort to fight or flight. Urgency is also likely to increase when delaying a response will make matters worse. Urgency is evaluated on a continuous scale: the more important the goals/needs and the greater the time pressure, the more urgent the action becomes. Urgency depends not only on the relevance of an event for an organism's goal/need, but also on temporal constraints.

Coping potential determination

This group of checks determines to what extent the organism can deal with a particular object or event. One can distinguish three different objectives in checking one's coping potential—control, power, and adjustment capacity.

Control check. A central determinant of coping potential concerns the degree of control possible in a particular situation. In many cases, this depends on the nature of the agent responsible for having caused the event. For example, an act of nature is something for which no control attempt can possibly succeed. In other cases, more or less control might be possible, for example, in the case of critical phases during which events can still be influenced.

Power check. If control is possible, the question becomes how much power or how many resources one has to influence the consequences of an event. These may be personal resources such as physical, intellectual, financial, and social-relational resources. In other cases, it might be the possibility of calling on help from others (such as summoning one's elder brother in a fight in the school yard).

Adjustment capacity check. Finally, if consequences cannot be changed, coping potential depends on how well one can live with the consequences of an event, that is, how well one can adjust to the consequences or implications of the event.

Normative significance evaluation

In socially living species, there are two more checks that take into account how the majority of the other group members evaluate an action and the significance of an emotion-producing event for one's self-concept and self-esteem. Obviously, this appraisal objective is—by definition—only relevant in socially organized species capable of a self-concept and of a mental representation of sociocultural norms and values. This type of appraisal is served by the following two checks (see Scherer, 2001).

Internal standards check. This check evaluates the extent to which an action falls short of or exceeds internal standards, such as one's personal self-ideal (desirable attributes) or an internalized moral code (obligatory conduct). These can often be at variance with cultural or group norms, particularly in the case of conflicting role demands or incompatibility between the norms or demands of several reference groups or persons. For example, a failed student will react with a different emotion if s/he has an ideal self-concept of being a brilliant scholar in the respective field as compared to a self-ideal of being a financial wizard.

External standards check. Social organization in groups implies shared values and rules (norms) concerning status hierarchies, prerogatives, desirable outcomes, and acceptable and unacceptable behaviors. The existence and reinforcement of such norms depends on the emotional reactions of group members to behavior that both violates and conforms to norms. The most severe sanction a group can use against someone who violates norms—short of actual aggression—is the relegation of this person to the status of an outsider or a reject. Therefore, evaluating the significance of a particular action in terms of its social consequences is a necessary step before deciding on appropriate behavioral responses. This check evaluates to what extent an action is compatible with the perceived norms or demands of a salient reference group in terms of both desirable and obligatory conduct. Our student would appraise his/her failure quite differently on this check, depending on whether s/he applies the intellectual expectations and study performance standards of a group of junior scientists or those of the university football team.

Before turning to the results of the appraisal process, a note on the importance of a general valence dimension underlying appraisal is in order. While all of the appraisal checks described above evaluate different criteria, these are all *valenced* (i.e., the outcome of the check will be considered as more or less positive or negative, or good or bad, by the organism). The two classic valence checks are of course intrinsic pleasantness and goal conduciveness (a distinction that is unfortunately rarely made in the literature, even though it can be shown that the basis of the evaluation and in part also its consequences can be different, see Aue & Scherer, 2011). But the other checks also involve valenced outcomes. Thus, it is generally considered as positive and desirable for an organism to be strong, powerful, and dominant, whereas being weak and submissive is, generally, seen as negative. Behavioral outcomes that are consistent with one's self-image and feeling of self-worth are evaluated as positive, whereas failure to live up to one's standards is seen as rather negative. Similarly, behavior that is consistent with social values or norms is almost universally considered as good, whereas a violation of norms and values is seen as bad. The situation is a bit more complicated for the novelty check. Here, a curvilinear relationship seems to hold—too much suddenness and unpredictability may be dangerous and thus bad; on the other hand, too much familiarity and predictability breeds boredom, which is also bad. Thus, a safe amount of novelty and unpredictability is good. Table 1.1 illustrates these six types of valence in relation to the appraisal criteria.

Table 1.1 Varieties of valence and dimensions of the affective space

Evaluation checks	Evaluation outcomes	Type of valence/feeling dimensions
Novelty	Newness—familiarity	Valence as predictability
Intrinsic pleasantness/beauty	Pleasure—displeasure	Valence as pleasure
Goal/need relevance	Satisfaction—frustration	Valence as satisfaction
Coping potential	Power—weakness	Valence as power/dominance
Compatibility self-concept/standards	Achievement—failure	Valence as self-worthiness
Compatibility social norms/values	Virtue—vice	Valence as moral worthiness

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1.5 Response patterning

Component patterning

For each sequential stage of assessment based on the appraisal checks outlined above, there are two types of output: (1) a *modification* of the cognitive and motivational mechanisms that have influenced the appraisal process; and (2) *efferent effects* on the periphery, in particular the neuroendocrine system and the autonomous and somatic nervous systems. In this model, emotion differentiation is predicted as the result of the net effect of all subsystem changes brought about by the outcome profile of the appraisal sequence. Thus, as shown in Figure 1.2, the fundamental assumption of the CPM is that the appraisal results drive the response patterning in other components by triggering efferent outputs designed to produce adaptive reactions that are in line with the current appraisal results (often mediated by motivational changes). Thus, emotion differentiation is the result of the net effect of all subsystem changes brought about by the outcome profile of the appraisal sequence. These subsystem changes are theoretically predicted on the basis of a componential patterning model, which assumes that the different organismic subsystems are highly interdependent and that changes in one subsystem will tend to elicit related changes in other subsystems. As illustrated in Figure 1.2, this process, similar to appraisal, is highly recursive, which is what one would expect from the neurophysiological evidence for complex feedback and feedforward mechanisms between the subsystems. As shown in Figure 1.2, the result of each consecutive check is expected to differentially and cumulatively affect the state of all other subsystems.

The CPM makes specific predictions about the effects of the results of certain appraisal checks on the autonomic and somatic nervous systems, indicating which somatovisceral changes and which motor expression features are expected, based on both the general functions of the emotion components and the specific functions of each appraisal check. In particular, specific motivational and behavioral tendencies are expected to be activated in the motivation component in order to serve the specific requirements for the adaptive response demanded by a particular appraisal result. In socially living species, adaptive responses are required not only for the internal regulation of the organism and motor action for instrumental purposes (organismic functions), but also for interaction and communication with conspecifics (social functions).

Integration and central representation

The CPM assigns a special status to the feeling component in the emotion process, as it monitors and regulates the component process and enables the individual to communicate its emotional experience to others. If subjective experience (the feeling component) is to serve a monitoring function, it needs to integrate and centrally represent all information about the continuous patterns of change and their coherence in all other components. Thus, feeling is an extraordinarily complex conglomerate of information from different systems. Figure 1.3 shows how the different components of the emotion process might be integrated and represented in a unitary fashion in what philosophers have described as qualia (see Scherer, 2009a). As shown on the left side of Figure 1.2, the autonomic physiology, the motivation, and the motor expression components are driven by the appraisal component (which is, in turn, influenced by the changes that occur in these other components and which may be in part the results of component-specific factors). The current state of each of these components is then represented in an integrated fashion in the feeling component. Quality, intensity, and duration of the feeling are determined by these integrated inputs. Appraisal results will be represented by the patterning of the appraisal check results and the weights that are assigned to individual appraisal checks. Both autonomic physiology and motor expression changes will be represented as a function of the respective response patterns and their amplitude. Finally, the motivation component will be represented by the nature of the action tendencies that have been elicited, as well as by the estimated urgency of action.

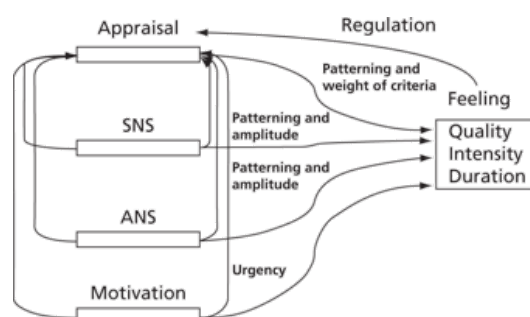


Figure 1.3 Integration of emotion components.

Reproduced from Philosophical Transactions of the Royal Society, Series B, 364, (1535), Emotions are emergent processes. They require a dynamic computational architecture, Scherer, K. R. pp. 3459–3474 © 2009, The Royal Society, with permission.

Scherer (2004) describes in detail which integration tasks need to be achieved in the process. Information needs to be integrated in the cognitive component, as different appraisal results may vary greatly with respect to the nature of the outcome. Information integration is also required for the response components, as the response modalities, for example, physiological variables and expressive behaviors, vary greatly with respect to their underlying metric. Finally, multicomponent integration is required to bring all the separate information channels together. In addition, temporal integration has to be achieved to create the impression of a coherent episode.

1.6 Emotion words and modal emotions

In the preceding description of the architecture of the CPM, the issue of the number, nature, and qualities of the tokens of the “emotion” category type (i.e., the individual emotions) and in particular the issue of verbal labels for these tokens, has not been addressed. This issue is of course linked to the debate about the definition of emotion and is just as controversial. Basic emotion theories are resolutely based on the claim that a limited number of affect programs for a limited number of discrete emotions exist, such as anger, fear, joy, and sadness, a number that varies, depending on the theorist, between 5 and 15. However, most adherents to that tradition concur that there are also other emotions, often called “secondary,” as evidenced by the existence of respective labels (e.g., Ekman, 2003). Dimensionalist/constructivist theories see emotions as a sociocultural construction defined by the available labels that individuals bestow on “conceptual acts” in rudimentary states of “core affect” (described as points in a two-dimensional valence $\times$ arousal space). The emphasis of the research in this approach seems to be to identify, in an ideographic fashion, motivational or contextual factors (such as salience or situational priming) that are seen to determine the “constructive” choice of a label (e.g., Lindquist & Barrett, 2008; see also Deonna & Scherer, 2009). In both of these cases, emotion words have a different, but secondary function. In the case of basic emotion theories, they just name the response patterns produced by the psycho-biologically defined affect program. In the constructivist case, emotion words serve as arbitrary labels that individuals can use to conceptually categorize rudimentary affective states of positive or negative arousal. A central discussion between the adherents to these two theoretical traditions concerns the question of whether the emotions referred to by the verbal labels are natural kinds (Bird & Tobin, 2008). Obviously, basic emotion theories, assuming the evolutionary continuity of a small number of affect programs, tend to assume that the emotions are indeed natural kinds (Griffiths, 2004), whereas constructivists attempt to show that there is no evidence for this assumption (Barrett, 2006a).

The CPM takes a very different approach to this issue by assuming that many different combinations of appraisal check results are possible (especially since evaluation is thought to occur in a graduated fashion, determining not only the type but also the intensity of the emotional arousal). In consequence, the number of potential emotional states (as defined by the process of synchronized patterning of all components in the emotion episode time window) is virtually infinite. However, some major patterns of adaptation in the life of animate organisms reflect frequently recurring patterns of environmental evaluation results (Scherer, 1994). All organisms, at all stages of ontogenetic development, encounter blocks that need satisfaction or goal achievement at least some of the time. Thus, frustration in a general sense is universal and ubiquitous. Equally universal are the two major reaction patterns fight and flight. Consequently, it is not surprising that the emotional states that often elicit these behaviors, anger and fear, respectively, seem universal and are present in many species. In terms of the model proposed here, it is highly likely that, if one were to compile a frequency distribution of appraisal check patterns, some combinations of check results would be found to be frequently encountered by many types of organisms, giving rise to specific, recurring patterns of state changes.

Early on, the term *modal emotions* was suggested to refer to the states resulting from these predominant appraisal check outcomes that are due to general conditions of life, constraints of social organization, and similarity of innate equipment (Scherer, 1984a). Just as certain appraisal check outcomes in response to certain types of situations are more frequent, the patterning of elements in the other emotion components would also occur more frequently. Modal emotions are characterized, then, by a prototypical pattern of appraisals and the corresponding patterning of expression, autonomic arousal, action tendencies, and feeling states. This would account, it seems, for the evidence for universal prototypical patterns mentioned at the outset. However, it is important to highlight the central difference of the modal emotion concept to the postulate of basic emotions: no effort is made to find or define a definite number of homogeneous, integral categories or mechanisms that justify an a priori definition of basic or fundamental phenomena. Instead, the modal emotion concept proposes empirically studying the frequency with which certain patterns of sequential, synchronized changes in the different components of emotion episodes occur.

The study of verbal labeling plays a special role in efforts toward an empirical assessment of modal frequency or “bunching.” Given the prominence and the frequency of occurrence of these episodes of highly similar emotional experiences, it is not surprising that they have been labeled with a short verbal expression, mostly a single word, in most languages of the world. This would be predicted on the basis of a principle of economical verbal coding of objects of communication (see Clark & Clark, 1977, pp. 552–557; Whorf, 1956; Zipf, 1949). Thus, discreteness is—at least in part—bestowed by linguistic categorization and the cultural prototypes that these categories reflect (see Shaver, Schwartz, Kirson, & O’Connor, 1987). Linguistic categories conceptually order the world for us in many domains and they do so for emotion. Among the many advantages of this categorical organization are cognitive economy and communicability of the underlying referents. One can venture specific theoretical predictions as to the patterns of appraisal check results that are likely to produce such modal emotions, as they are labeled in many different languages of the world (see Scherer, 1986a). In fact, we can show that a simple expert system allows prediction of the use of verbal labels for emotional experiences on the basis of the subject’s recalled appraisal processes (Scherer, 1993; Scherer & Meuleman, 2013).

It is important to keep in mind that the activity of labeling is independent of the emotion process and of emotional experience as a whole (Scherer, 1994). Depending on the communication intentions of the language users, it is to some degree arbitrary which aspects of the emotion process are selected and labeled by a word in the language. Thus, there are some words that mainly select out the physiological reaction component, such as “aroused” or “tired.” Some are cognitive, such as “bewildered” or “curious.” Others focus on specific sociomotivational antecedents, such as “jealous.” Still others emphasize the action tendency aspect, such as “hostile.” Thus, the special importance of the “basic emotion words” may reside in the fact that they refer to a more global set of changes in many of the subsystems of our emotion construct (see Scherer, 1984b).

It is important to note that the existence of a specific emotion label in one, or even several languages, does not yet establish the existence of a corresponding, frequently occurring pattern of appraisal check results with respective componential response patterning, that is, a modal emotion. This would seem to be a matter for empirical investigation. Consequently, a verbal emotion label cannot be used as an explanans (as it often is in the psychology of emotion); rather, it is an explanandum. Emotion labels may in part be based on typical reactions of the social environment, which may be similar for different emotions (cf. the constructionist view held by Averill, 1980; see also Mesquita & Frijda, 1992). Consequently, empirical investigation is required to determine how patterns of event appraisal and the nature of the subsequent subsystem responses result in the use of a particular emotion word or expression by the experiencing subject.

On the basis of an emergent notion of emotion, as defended by certain appraisal theories, it can be reasonably argued that there are as many different emotions as there are discriminably different profiles of appraisal with corresponding response patterning (Scherer, 1984b)—and these are likely to generate different forms of qualia, even though they will obviously be categorized into larger classes for labeling. Using the definition proposed above, in particular the necessary criterion of response synchronization, the number of different emotions could, in principle, be determined empirically by analyzing the response profiles of a very large number of emotion experiences and determining the number of clusters that have similar profiles. However, this proposal is only of academic interest as, in addition to conceptual problems such as the criterion for a sufficient level of response synchronization, problems of access to a vast range of naturally occurring, everyday emotional episodes and problems of measurement render such an empirical assessment impracticable.

1.7 Categorization and verbalization of feeling

How do qualia emerge into consciousness and what is the nature of the categorization and verbalization process? The CPM model offers a conceptualization of the problem, as shown in Figure 1.4, using a Venn diagram in which a set of overlapping circles represents the different aspects of feeling. The first circle (A) represents the sheer reflection or representation of changes in all synchronized components in some kind of monitoring structure in the central nervous system (CNS). This structure is expected to receive massive projections from both cortical and subcortical CNS structures (including proprioceptive feedback from the periphery). The second circle (B), only partially overlapping with the first, represents that part of the integrated central representation that enters awareness and thereby becomes conscious, thus constituting the feeling qualities, the qualia that philosophers and phenomenologically minded psychologists have been most concerned with. Thus, this circle corresponds most directly to what is generally called “feelings.” The conscious part of the feeling component feeds the process of controlled regulation, much of which is determined by self-representation and socio-normative constraints. It is hypothesized that it is the degree of synchronization of the components (which might in turn be determined by the pertinence of the event as appraised by the organism) that will generate conscious experience.

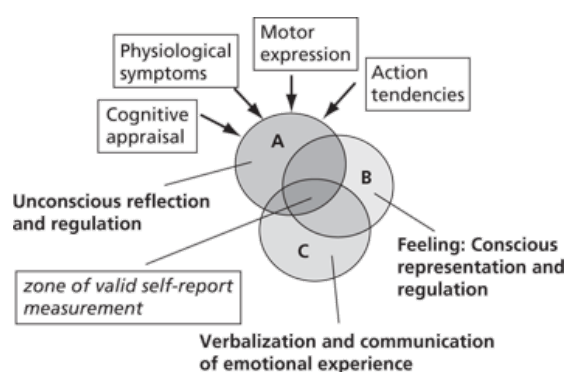


Figure 1.4 The reflection of component emotion processes in a monitor system (circle A), the emergence of consciousness (circle B), and categorization and verbalization (circle C). Reproduced from Scherer, K. R., *What are emotions? And how can they be measured?*, *Social Science Information*, 44(4) (c) 2005, SAGE Publications Ltd. All rights reserved.

Although a richly textured conscious feeling that fits the situation that a person experiences like a glove is highly functional for fine-tuned adaptation and regulation, it is less well suited to cognitive manipulation, memorization, or communication. Of course the same is true for all of perception, which is why categorization plays such a major role in all of cognitive processing.

p. 22 Unfortunately, all we can currently measure is the individual's verbal account of a consciously experienced feeling, represented by the third circle (C) in Figure 1.4. Drawing this circle as only partially overlapping with the circle representing conscious experience (B) is meant to suggest that the verbal account of feelings captures only part of what is consciously experienced. This is so for two reasons: (a) verbal report relies on language and thereby on the emotion categories and other devices (at any level: phonetics, morpheme choice, words, phrase construction, sentence structure, text structure) available to express the qualia that are consciously experienced. Apart from capacity constraints (the stream of consciousness cannot be completely described by a discrete utterance), it is unlikely that these linguistic devices are capable of completely capturing the incredibly rich texture of conscious experience. In other words, language can only represent part of the complexity of conscious thought (and the accompanying emergent experience of feeling). Furthermore, (b) contextual constraints (cultural, situational) *unconsciously* limit what we become aware of and can attempt to express linguistically. In addition, there can be a desire to control the expression of emotion and to suppress the tendency to label or report certain aspects of one's innermost feelings.

How can one envisage the process of feeling categorization on the basis of the component process architecture? A more detailed recent suggestion on this issue (Scherer, 2009a), of central importance for this book, starts with the important early contribution to this domain made by Rosch (1973a), who proposed two general principles for the formation of categories that have been widely accepted: (a) cognitive economy, reducing the infinite differences among stimuli to behaviorally and cognitively manageable scope; and (b) reflection of perceived structures and regularities in the world. The author also distinguished between vertical (inclusiveness of a category) and horizontal (differentiation of categories at any one layer) levels of categorization and proposed that the use of prototypes, containing the most representative attributes inside a category, will increase the flexibility and distinctiveness of categories along the horizontal dimension. Shaver and his collaborators (Shaver, Schwartz, Kirson, & O'Connor, 1987) have shown the utility of this approach for understanding the emotion vocabulary, distinguishing between superordinate (positive, negative emotions), basic (joy, fear, anger, sadness), and subordinate (irritation, rage) category levels.

As categorization occurs before verbalization (e.g., in very young children, Hamlin, Wynn, & Bloom, 2007; Hirschfeld, 2001), preverbal categories for emotional feelings are likely to be formed by the observation of regularity in the differential patterning of different emotional experiences. Thus, one would expect prelinguistic categories to precede verbalization (on the ontogenetic and microgenetic levels). It is reasonable to assume that the lowest level of inclusiveness, as defined by Rosch, is that of the preverbal qualia, as they represent qualitative types of experiences that can be recognized and remembered. This level can be expected to be idiosyncratic and fuzzy. More inclusive categories might be formed through a constraint satisfaction procedure between cognitive economy optimization and the practical importance of certain structures and regularities encountered during emotion episodes. Even though the content of the qualia is likely to consist of an integrated representation of the individual components, one might imagine that some components, especially those that best differentiate types of qualia, are more important than others in determining categorization beyond the first preverbal categories.

One candidate for determining category formation is somatovisceral feedback, which was highlighted by the peripheralist tradition founded by James and Lange (Mandler, 1975; Schachter & Singer, 1962) and which has currently been revived under the concept of embodiment (Barrett, 2006a; Prinz, 2004). As postulated by the CPM, somatovisceral feedback, as part of the representation of the efferent effects of appraisal results, is indeed one of the central determinants of categorization. However, other factors are needed to further differentiate bodily feedback, as certain types of physiological activation occur in a similar form in several emotions. For example, an increase in heart rate and in muscle tension generally occurs because sympathetic activation serves urgent action preparation, a feature shared by several emotions. In consequence, it seems unlikely that this modality is the *only* determinant of category formation (as many critics of the James/Lange position have argued over the last century). The “perception of bodily changes” may well add color to the emotional experience (as James, 1890, argued), for example, concerning the intensity and vividness of the feeling, but it is unlikely to account for the bulk of differentiation and categorization of feelings. One can reasonably argue that appraisal configurations (Scherer, 2001), core relational themes (Lazarus, 1991a; Smith & Lazarus, 1993), or action tendencies (Frijda, 1986, 1987) are more promising candidates. This is one of the claims to be discussed in this volume.

It is thus likely that qualia clusters, representing integrated appraisal configurations and action tendencies that occur relatively frequently and are of central importance to the individual’s well-being (modal emotions), will serve as the basis for categorization into more inclusive categories on Rosch’s vertical dimension. As suggested early on (Scherer, 1984b, p. 311), one would expect that it is those modal categories that are generally labeled with a single word or a brief expression in most languages of the world. The availability of such linguistic labels (corresponding to both the subordinate and basic levels of categorization in Shaver’s system) imposes a large degree of separateness and discreteness to particular types of experiences.

An interesting question is whether the act of categorization that is implied by verbal labeling, which will undoubtedly affect the representation of the emotional experience, may impoverish the rich qualia experience and mold it into socioculturally determined schemata.

A requisite to investigate this issue is to fully understand the semantic content of the verbal labels. While dictionary definitions in different languages, as well as thesaurus entries, may be useful, reflecting the learned intuitions of the language experts responsible for the respective entries, this approach is neither sufficiently comprehensive nor consensual enough to be appropriate for scientific profiling of emotion terms. Chapter 4 describes a variety of linguistic methods to describe emotion lexical meaning, which are currently used in lexical semantics. However, many of the underlying approaches are underspecified in that they are not domain-specific and do not take into account the specific nature of the signified concepts, that is, the construct of “emotion.” This is particularly serious, as emotions are unlikely to represent “natural kinds,” in philosophical parlance. An interesting alternative option would be to conceptualize, measure, and compare the semantics of emotion terms in a *domain-specific* manner, taking into account the unique construct of emotion.

For that purpose, we propose to use the current state of knowledge about the elicitation and differentiation of emotion to deduce what elements would need to be represented in the semantic content of different emotion words in different languages. The approach advocated here is based on componential emotion theories, in general, and the CPM model in particular.

Additionally, since languages differ with respect to emotion vocabulary, in order to improve the model, it is imperative to better understand the nature and origin of the differences between the semantic fields of emotion terms in different languages across the world. Chapter 3 describes the current state of the art in linguistics and anthropology with respect to this question.

1.8 Design feature analysis of affect concepts

p. 24

Before addressing the measurement of the meaning of terms representing individual emotions, one needs to define the domain from which to draw the respective exemplars. This is all the more necessary since, as described above, there is widespread disagreement as to which states qualify as an emotion. In consequence, it seems useful to first define how emotions differ from preferences, ↳ moods, attitudes, interpersonal stances, and other types of affective phenomena that populate the domain that used to be called the “sentiments.” One can use Hockett’s (1960) notion of *design features* (see Hauser, 1996) to distinguish words that designate emotions (fearful, sad, ashamed, happy, angry) from those that refer to other types of affective states (liking, ironic, depressed, hostile, cheerful, cranky). Scherer (2005a) has suggested five such types of affective phenomena that should be distinguished from emotion proper, although there may be some overlap in the meaning of certain words: preferences, attitudes, moods, affect dispositions, and interpersonal stances. Table 1.2 shows these design features and how they can be used to disambiguate different affect terms and differentiate two types of emotion—utilitarian and aesthetic.

Table 1.2 Design feature differentiation of different types of affective phenomena

Design features Type of affect	Event focus	Intrinsic appraisal	Transactional appraisal	Synchronization	Rapidity of change	Behavioral impact	Intensity	Duration
Preferences	VH	VH	M	VL	VL	M	L	M
Attitudes	VL	L	L	VL	L	L	M	H
Moods	L	M	L	L	M	H	M	H
Affect dispositions	VL	L	VL	VL	VL	L	L	VH
Interpersonal stances	H	L	L	L	VH	H	M	M
Aesthetic emotions	H	VH	L	M	H	L	L-M	L
Utilitarian emotions	VH	M	VH	VH	VH	VH	H	L

Note: VL = very low, L = low, M = medium, H = high, VH = very high

Reproduced from Social Science Information, 44 (4), What are emotions? And how can they be measured? Scherer, K. R., pp. 695–729, Table 2 © 2005, Sage Publications, with permission.

In particular, bona fide emotions must possess the following characteristics or design features:

Event focus. The definition given above suggests that emotions are generally elicited by stimulus events; that is, something happens to the organism that stimulates or triggers a response after the event has been evaluated for its significance. Philosophers talk about emotions having an *object* (Deonna & Scherer, 2009; Mulligan & Scherer, 2012). Such objects can consist of natural phenomena such as thunderstorms, the behavior of other people or animals that may have significance for our well-being, one's own behavior, sudden neuroendocrine or physiological changes or even memories or images. The need for emotions to be somehow connected to or anchored in a specific event, external or internal, rather than being free-floating, resulting from a strategic or intentional decision, or existing as a permanent feature of an individual, constitutes the event focus design feature.

Appraisal driven. The eliciting event and its consequences must be relevant to major concerns of the organism, as determined by a complex, yet very rapidly occurring appraisal process that can occur on several levels of processing ranging from automatic and implicit to conscious conceptual or propositional evaluations (Leventhal & Scherer, 1987; van Reekum & Scherer, 1997).

p. 25 **Response synchronization.** This design feature of the proposed emotion definition is implied by the adaptational functions of emotion. If emotions prepare appropriate responses to events, the response patterns must correspond to the appraisal analysis of the presumed implications of the event, resulting in massive mobilization of resources coordinated by response synchronization (Scherer, 2001).

Rapidity of change. Events, and particularly their appraisal, change rapidly, often because of new information or re-evaluations. As appraisal drives the patterning of the responses in the interest of adaptation, the emotional response patterning is also likely to change rapidly as a consequence. Although we are in the habit of talking about "emotional states," these are rarely steady states. Rather, emotion processes are undergoing constant modification, allowing rapid readjustment to changing circumstances or evaluations.

Behavioral impact. Emotions prepare adaptive action tendencies and their motivational underpinnings and thus have a strong effect on emotion-consequent behavior, often interrupting ongoing behavior sequences and generating new goals and plans. In addition, the motor expression component of emotion has a strong impact on communication, which has important consequences for social interaction.

Intensity. Given the importance of emotions for behavioral adaptation, one can assume the intensity of the response patterns and the corresponding emotional experience to be relatively high, suggesting that this may be an important design feature in distinguishing emotions from moods, for example.

Duration. Conversely, as emotions imply massive response mobilization and synchronization as part of specific action tendencies, their duration must be relatively short in order not to tax the resources of the organism and to allow behavioral flexibility. In contrast, low intensity moods that have little impact on behavior can be maintained for much longer periods of time without showing adverse effects.

It should be noted that the widely used term *feeling* does not figure in the list of affective states to be distinguished from emotion. As shown above, the CPM reserves the use of this term for the *subjective emotional experience component of emotion*, presumed to have an important monitoring and regulation function. In fact, it is suggested that “feelings integrate the central representation of appraisal-driven response organization in emotion” (Scherer, 2004), thus reflecting the total pattern of cognitive appraisal, as well as motivational and somatic response patterning, that underlies the subjective experience of an emotional episode. Using the term feeling (a single component denoting the subjective experience process) as a synonym for emotion (the total multimodal component process) produces serious confusions and hampers our understanding of the phenomenon. In fact, it can be argued that the long-standing debate generated by William James’ peripheral theory of emotion is essentially due to James’ failure to make this important distinction: When he asked “What is an emotion?” in 1884, he really meant “What is a feeling?” (see Scherer, 2000a). Unfortunately, it seems difficult to convince emotion researchers to reserve feeling exclusively as the term for the experience component of emotion and to combat the tendency to use feeling as a synonym for emotion. As the feeling component is the gateway to consciousness of an emotion episode, and thus to classification and verbalization, the emotion words are in fact *also* words for *emotional feelings*, used by the person experiencing the emotion episode to label and communicate the felt experience. However, the same words are also used by observers, including scientists, who have no access to the person’s internal feeling state to refer to the complete package of component changes in the emotion episode that are observable (for example, verbal utterances, facial and vocal expression, signs of physiological arousal such as blushing or heavy breathing, or cues for action tendencies such as raising one’s arm in preparation of hitting), or that can be inferred (with more or less accuracy) from situational and contextual cues. Thus, emotion words function at the same time as markers for emotion episodes with special qualities of the synchronized components (the full package) and for the special quality of the conscious feeling.

There are, of course, other kinds of feelings, as philosophers do not tire of pointing out (see Mulligan & Scherer, 2012). Thus one can feel warm, self-assured, combative, weak, tired, aroused, good or bad, and so on. One can also feel pain in the right foot, a warm breeze, or pity with someone else's plight. Feeling is a general term for the subjective experience of sensory stimuli or internal states. Thus, feeling terms, or more generally, feeling expressions, constitute a special class of lexical units that are semantically marked by their special mode of reference to a subjective experience as internally felt by a person. In each case, the nature, object, or domain of the feeling needs to be specified, such as bodily sensations or mental states. The canonical emotion words, on which this volume is focused, are special in that a coherent package of changes in several domains or components, including the feeling component, is referenced. However, there are also feeling terms that refer to subjective experiences linked to individual subsystems, which may be involved in affective reactions. In these cases, the degree of synchronization with other subsystems may vary and thus it might not be justified to use an emotional term that requires a high degree of synchronization of several subsystems. Thus, feeling hot or tense, or feeling one's heart racing, refers to the experience of bodily reactions. Feeling one's jaw drop or one's voice quiver is part of the expression component. Feeling combative or listless belongs to the action tendency component. Feeling confident or righteous is part of the appraisal component. In contrast, words for emotional feelings, such as feeling angry, sad, shameful, or proud, refer to the full, synchronized emotion "package," as described above. There are some special cases, in particular the terms used by dimensional emotion theorists, such as feeling good or bad, strong or weak, or more or less aroused. These represent a low-dimensional descriptive level of the emotional feeling component, which integrates the changing states of the other components. The terms used for the dimensions in this low-level mapping of the complex packages may reflect the contributions of individual components or of a coherence of several components. Thus, feeling good or bad is likely to be a direct consequence of a valence appraisal, but may, in some cases, also reflect pleasurable bodily sensations. Feeling calm or aroused probably represents the overall level of autonomic activity in the bodily reactions, but may also reflect more or less turbulence in mental operations. Finally, feeling strong or weak is likely to reflect the outcome of a differentiated appraisal of how well one can cope with the consequences of a particular event, but may also indicate the feeling of bodily condition. In contrast to the emotional feelings that are part of the emotion packages, these feeling terms are more diffuse, indicating broad regions of affective space rather than precise coordinates, as marked by emotion terms.

1.9 Developing a feature profile to measure the semantics of emotion words—the GRID

The design feature analysis described above suggests that the uniqueness of the emotion construct, apart from its episodic nature, consists in its *multi-componentiality*, the packing together of complexly organized profiles that reflect temporary synchronization of subsystems (a proposal that seems to find approval with emotion researchers from different traditions; see the commentaries on Scherer, 2005a, in Frijda, 2007b). Having clarified how the term "emotion" can be differentially defined as a specific category type of affect, the next issue is to construct a framework that can be used to differentiate the different tokens of that special category of affect, that is, the individual "emotions," in a principled fashion.

p. 27 Scherer (2005a) proposed a variant of the design feature approach outlined above to establish semantic feature profiles of folk concepts of emotions represented by emotion terms from natural languages. The underlying idea is that whereas all emotion terms share features pertaining to the synchronized components, *the profile of appraisal check results and the specific response profiles across the components are different for qualitatively different emotions*. This amounts to defining the meaning of emotion words as the *specific pattern of appraisal and response changes in all components that are implied when a specific word is used to describe an emotion episode*. This form of representation of qualitative differences between emotions can be directly applied, for example, to differentiate terms within an emotion family (e.g., irritated, angry, mad) and to examine the semantic overlap of translationally equivalent words across different languages.

How can such meaning profiles be empirically assessed? Scherer (2005a) suggested having emotion words rated by native speakers of different natural languages with respect to a large number of features for each of the emotion components described above. For example, one can ask participants to imagine a person whose emotional experience at a particular point in time is consensually described by observers as “irritated.” Then raters are asked to evaluate the typical eliciting and response characteristics that would warrant the description of the person’s emotional state with this label. This would include items on the eliciting event, the type of appraisal the person is likely to have made of the event and its consequences, the response patterns in the different components (e.g., bodily reactions, facial and vocal expressions), the behavioral impact (action tendencies) generated, and the intensity and duration of the associated experience. For this procedure, the name *semantic grid profiles* was proposed, as the ratings on the component features for different emotions can be arranged in a grid with the respective emotion words as columns, as shown in Table 1.3. In this volume, this approach will be referred to more briefly as the *GRID paradigm*.

Table 1.3 A simple example of a component-based semantic grid

Emotions Features	Anger	Fear	Shame	Guilt
Event is novel	2	7	6	2
Caused by other	8	2	5	2
Outcome is negative	7	4	5	1
Heart beats faster	7	9	4	2
Feel hot	6	2	8	2
Smile	1	1	4	1
Feel like attacking	7	3	1	1
Try to hide feeling	2	4	6	8
Last long time	4	2	3	7

Note: The numbers in the cells indicate the probability of the respective feature being applicable to an emotional experience labeled with the respective emotion word.

Semantic grid profiles for different emotion terms allow, at least if there is reasonable agreement between raters (in the sense of inter-rater reliability), to define the meaning of an emotion term in the respective language. In addition to facilitating the examination of subtle differences in the meanings of different emotion terms and providing similarity-of-profile data that can be used to statistically determine the relationships between members of emotion families and the overall structure of the semantic space for emotions, such data for different languages inform us about potential cultural and linguistic differences in emotion encoding. This aspect, apart from the scientific interest, is of great value to ensure comparability of instruments in intercultural studies.

It should be noted that Table 1.3 suggests a parametric precision that is unlikely to be attained in reality. It is plausible that, apart from the fact that there will be a range of variation in the assessment between different speakers of a language, the semantic profiles constitute fuzzy sets in the sense that not all conditions need to be met for the meaning of a word to be recognized (cf. prototype semantic concepts described in Chapter 4). Apart from the probability that there will be different configurations that are acceptable to justify the use of a word, it is to be expected that different sets of weights that are applied to different components. This is one of the more probable reasons for the differences observed across languages and cultures. For example, in languages that favor a “somaticized” emotion lexicon (see Chapter 3), it is likely that a stronger emphasis on and weighting of physiological features will be found.

It is interesting to speculate what has determined the central and most strongly weighted feature configurations in the semantic profiles in the development of a language—is it that individuals share similar emotional experiences and thus develop similar semantic representations, or is there social pressure in a linguistic community to reach consensus on semantic profiles? As is often the case with such questions, both factors have probably played a role. One can argue that the individual experiences are extremely variable and that there is no need for precise labels unless one is required to provide one—as in responding to questionnaires. In fact, even when communicating or sharing an emotional experience, individuals rarely use emotion category labels in a spontaneous fashion when describing emotional episodes; rather, they often refer to these in terms of situations or events and the resulting response patterns. Thus, people can simply refer to one of the components, whichever is most salient in their representation of the situation. For example, to the question “how did you feel?”, people may say “abused” (appraisal of event), “I couldn’t stand still” (expression), “my heart was racing” (physiology), “I was upset/deeply affected” (feeling), “Like I didn’t know how to react” (action tendency), etc. The specific emotion felt in each case (sadness, fear, anger, joy?) is left to be inferred (e.g., “abused” = sad? angry?; “upset” = sad? angry? worried?; “deeply affected” = sad? concerned? shocked?). The context can disambiguate different potential meanings. This suggests that labeling may not be necessary for emotion memory. In consequence, it may be the case that social conventions for emotion labels are more determinative and that these may be based to a large extent on externally noticeable emotion manifestations that can serve to obtain agreement on the meaning of labels. Such shared definitions could consist of shared appraisal inferences from typical situations by personality interactions, as well as visible or audible manifestations of emotional arousal, such as externally visible signs of physiological changes (e.g., blushing or shaking) and facial, vocal, and bodily expressions that may indicate action tendencies.

1.10 Cognitive mechanisms of emotion encoding and decoding through words

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Given the architecture outlined above, especially with respect to the categorization and verbalization of prototypical forms of emotion processes with widely different qualities, one might ask exactly which mechanisms could be involved in the matching of a word that has a specific meaning in ordinary language with the fuzzy multicomponent profile likely to constitute the qualia entering consciousness. Based on the preceding discussion, a first hypothesis can be ventured. Starting from a model of appraisal registers for the sequential cumulative integration of the appraisals (see Figure 5.3 in Scherer, 2001), one can imagine an expanded model that includes the categorization and verbalization process. Concretely, in addition to the appraisal registers, one would include response registers for all components receiving efferent input from appraisal results. These registers, part of short-term working memory in executive space, contain the current state of the features in the different components in time (*current experience vectors*, corresponding to the component features in the GRID instrument). Lexical memory would be added to the model and each emotion word would be represented by *meaning prototype vectors* (again corresponding to the component features in the GRID instrument). In addition, the episodic long-term memory component would contain *past experience vectors* in which memory traces of past personal emotion experiences would be represented (again corresponding to the component features in the GRID instrument, and thus including somatic markers, but also stored appraisal configurations). On the basis of such architecture, one can envisage that the encoding of an emotional experience into an emotion word works through a matching algorithm. The latter would compute the respective distances between the current experience vector and the different meaning vectors for each of the emotion words that are salient in lexical memory, resulting in the choice of the most appropriate word on the basis of minimal distance. In the decoding process, an inverse matching process would take place, finding the minimal distance between the meaning vector of the given emotion word and the past experience vectors of the different memory traces of personal emotion experiences. These profile matching processes could be optimized by constraining the respective input profiles to particular regions of a multidimensional affective space generated in a similar fashion by both the individual experience vectors and the prototypical meaning vectors.

1.11 Conclusion: The promise of the GRID paradigm

The differences between the three major theoretical approaches (basic emotion, dimensionalist/constructivist, and componential appraisal theories) systematically outlined above were discussed with respect to the implications of each theoretical stance for our understanding of the semantics of emotion words in general and the semantic sedimentation hypothesis in particular. While the three theories agree about the existence of the components of emotion, they disagree with respect to their organization in emotion episodes. Constructivist theorists do not seem to envisage much organization of features within and across components. In contrast, basic emotion theorists assume a tight preordained organization as part of evolutionary stable affect programs, and appraisal theorists postulate a more flexible organization that emerges on the basis of specific configurations of appraisal results within social and environmental constraints and affordances. All three traditions agree that a central component is conscious feeling. Dimensionalist/constructivists see feeling as the first form of organization, the basic building block, arguing for “core affect,” which consists of the location of a feeling in two-dimensional valence $\times$ arousal space. For basic emotion theories, the primary emotions triggered by affect programs are represented in feeling as packages (which may be represented in dimensional space because of similarities and differences). The CPM assumes that feeling consists of an integrated representation of all component patterns in the episode in the form of nonverbal qualia that can be directly mapped into multidimensional affective space.

While all three theories postulate some form of categorization and labeling of conscious feeling, the presumed mechanisms are different. For constructivist theories, emotion terms are largely independent of the underlying affective processes—they are cultural constructs that are used to make sense of continuous changes in valenced arousal. Their application is seen as subject to a multitude of motivational and contextual variables.

p. 30 Basic emotion theorists assume that the felt basic emotion is given its appropriate label in the respective language, assuming a large degree of universality. As described above, the CPM assumes that the feature profile representing the multicomponent appraisal-response patterning is matched with an array of labeling options with prototypical semantic feature profiles. In summary, whereas basic emotion theories could be said to define the role of emotion terms as “program descriptors” and constructivist theories to see them as “meaning constructors,” the CPM views emotion terms as “modal response markers,” that is, marking a frequently occurring multicomponent configuration of appraisals and associated response patterns. In the current book, the CPM is taken as a point of reference to assess the meaning of emotion words.

The major claims made in this chapter on the basis of the CPM can be summarized as follows:

- Emotions are tightly organized packages of synchronized multicomponent response patterns driven by appraisal.
- These packages become available to consciousness in the form of nonverbal qualia that can be mapped into a multidimensional affective space.
- Some of these packages occur more frequently than others, given the pervasiveness of situations producing frustration, loss, achievement, etc., resulting in *modal emotions*.
- Most linguistic communities have given discrete labels to such modal emotions, which, due to the human condition, are often universal (although there may be specific emotions reflecting particular interpersonal relations in some societies).
- Given the modal response marking function of such lexical expressions, it can be expected that the semantics of the respective terms reflect the synchronized patterns of appraisal and response configurations in the underlying package.
- Feature profiles measuring the quality of the respective patterns can be used to empirically measure the meaning of specific nouns or other lexical units and to determine the differentiation as well as the similarity relationships between different terms and their translational equivalence across different languages.

In this chapter, the groundwork for a functional, psychological account of the nature of emotion words is laid—based on the CPM. In particular, the relationships of emotion words to the underlying sociopsychobiological processes were examined and potential mechanisms proposed that may be involved in the categorization and verbalization of the emotion process, including a preliminary architecture for encoding and decoding. The central claim is that the multicomponential nature of emotion requires a domain-specific approach that integrates the componential structure of emotion into semantic representation.

As a first step in using this framework, a proposal is made to measure the meaning of different emotion words through profiles of features that represent all of the components of the emotion construct. The utility, and future promise, of this proposal is to be assessed in the bulk of this volume, which describes a massive multiculture and multilanguage study using the proposed *GRID paradigm* to investigate the likelihood that the semantics of emotion words are grounded in specifiable profiles of component features that are stable across individuals and languages.

Notes

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