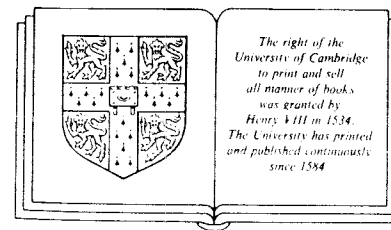# The Cognitive Structure of Emotions

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The Study of Emotion

Emotion is one of the most central and pervasive aspects of human experience. Normal people experience a wide range of emotions, from the quiet satisfaction of completing a relatively mundane task to the grief at the death of a loved one. Yet while emotions color, deepen, and enrich human experience, they can also cause dramatic disruptions in judgment and performance. Such disruptions can have profound and sometimes terrible consequences for individuals and society as, for example, in crimes of passion, suicides, and mental illness. This fact is clearly recognized by creators of literature, which thrives on the imagined emotions of its characters. The basic recipe is very simple: The writer describes a situation that readers recognize as being *important* to a character in the sense that it has important implications with respect to the goals, standards, or attitudes that the character is known or assumed to have. Then, the character is portrayed as correctly or incorrectly construing the situation as good or bad relative to these goals or standards or attitudes, and typically is described as having, or is assumed to have, a valenced (i.e., a positive or negative) *reaction* to the situation. Finally, the construal together with the reaction usually results in some sort of change in the character's judgment or *behavior*. Consider, for example, the main plot of *Othello*. We start with the assumption that the maintenance of Desdemona's love and fidelity is important for Othello. He then (incorrectly) construes Cassio's (presumed) actions as a threat to this goal and becomes consumed with anger and jealousy. The result is a dramatic deterioration in judgment and a correspondingly drastic action in which he kills both Desdemona and himself. As readers, a certain suspension of disbelief is required, but only up to a point. The essential ingredients have to be believable. If literature is a microcosm of the real world, it has to be recognizable as such.

It is apparent that writers can reliably produce in readers an awareness of a character's affective states by characterizing a situation whose construal is assumed to give rise to them. This suggests that writers use an implicit theory that individual emotions can be specified in terms of personal or interpersonal situational descriptions that are sufficient to produce them. Thus, writers do not always have to state what emotions a character is experiencing because if the described situation contains the *eliciting conditions* for a particular emotion, the experience of that emotion can be inferred. The fact that millions of readers, often over decades or even centuries, all infer similar emotions from the described situations suggests that this implicit theory cannot be too far wrong.

If the eliciting conditions of an emotion are to be effective, the experiencing individual must encode the relevant situation in a particular way. In other words, if an emotion such as distress is a reaction to some undesirable event, the event itself must be construed as undesirable, and because construing the world is a cognitive process, the eliciting conditions of emotions embody the cognitive representations that result from such construals. Perhaps one of the most obvious cases of the major contribution that cognition through construals makes to emotion is afforded by the reactions of players and fans at sports events. When one observes the reactions of the players to the outcome of an important game (for example, the final of the World Cup, or the NCAA basketball championship) it is clear that those on the winning team are elated while those on the losing team are devastated. Yet, in a very real sense, both the winners and losers are reacting to the same objective event. It is their *construals* of the event that are different. The victors construe it as desirable, the losers as undesirable, and it is these construals that drive the emotion system. The emotions are very real and very intense, but they still issue from cognitive interpretations imposed on external reality, rather than directly from reality itself. It is in this sense that we claim that there is an essential and profound cognitive basis for emotions.

Before we start, it is important to make clear that some emotions, (e.g., disgust), involve much less cognitive processing and structure than others (e.g., shame). Interestingly, however, those that involve relatively little cognition usually have metaphorical analogs that involve much more, whereas the converse is not true. Thus the emotion that one might experience in response to, for example, some totally inappropriate and unacceptable social behavior might well be called "disgust." On the other hand, it is difficult to imagine a cognitively impoverished analog of a social emotion such as embarrassment. We should also make clear at the outset that our claim that emotions always involve some degree of cognition is not the same as asserting that the contribution of cognition is necessarily *conscious*. To say that emotions arise from cognition is to say that they are determined by the structure, content, and organization of knowledge representations and the processes that operate on them. These representations and processes might sometimes be available to consciousness, but there is no reason to suppose that they necessarily are so.

Although we doubt that William James would have approved of our characterization of emotion in general, it is interesting to note that our claim that some emotions involve more cognition than others has a parallel in James's famous paper *What is an emotion?* (James, 1884). There, James restricted his discussion to emotions having "a distinct bodily expression"

in which "a wave of bodily disturbance of some kind accompanies the perception of the interesting sights or sounds, or the passage of the exciting train of ideas. Surprise, curiosity, rapture, fear, anger, lust, greed, and the like, become then the names of the mental states with which the person is possessed" (p. 189). Emotions like these, James called the "standard emotions." He seems to have considered the "standard emotions" to involve little or no cognition, arguing that "in advance of all experience of elephants no child can but be frightened if he suddenly finds one trumpeting and charging upon him" (p. 191). However, James acknowledged that there can be more complex emotion-inducing perceptions, ones which, in modern terms, would have to be described as involving a relatively high degree of cognition, such as events having to do with the violation of social conventions: "Most occasions of shame and many insults are purely conventional, and vary with the social environment." In considering these as potential counterexamples to his theory, James goes on, rhetorically: "In these cases, at least, it would seem that the ideas of shame, desire, regret, etc., must first have been attached by education and association to these conventional objects before the bodily changes could possibly be awakened" (p. 195). James's answer to this apparent threat is to assert that the nature of the emotion-inducing perception is not the issue; rather, the issue is that, once triggered, the perception gives rise to the bodily response that is the emotion. However, like it or not (and James is now in no position to object), James had essentially characterized a range of cognitive content for the emotion-producing perception from low (e.g., a mother's delight at the sight of her beautiful baby) to high (e.g., the delight of receiving a national honor).

Modern theories of cognition have relatively little to say in the way of specific proposals about affect and emotion (Norman, 1981; Zajonc, 1980). It is quite possible that the root cause of the dissociation between cognitive theories and emotion theories lies in the emphasis that has been placed in recent years on the computer metaphor of "human information processing." This approach to cognition has been as noticeable in its failure to make progress on problems of affect as it has been for its success in making progress on problems of cognition. Given the abundance of psychological evidence that cognitions can influence and be influenced by emotions (e.g., Bower, 1981; Isen, Shalker, Clark, & Karp, 1978; Johnson & Tversky, 1983; Ortony, Turner, & Antos, 1983; Schwarz & Clore, 1983), the absence of a viable account of the emotions compatible with a general theory of cognition renders existing theories of both inadequate.

Just as few theories of cognition have much to say about emotion, so theories of emotion tend to be unacceptably vague about exactly what role

cognition plays in emotion. Psychologists (e.g., Arnold, 1960; Lazarus, Kanner, & Folkman, 1980; Mandler, 1975; 1984) and philosophers (e.g., Lyons, 1980) frequently acknowledge that cognition plays an essential role in emotion, but for the most part they have not provided detailed proposals about exactly how this happens (but see, e.g., Abelson, 1983; Mandler, 1984). One of the clearer accounts is that offered by Mandler, who claims that what he calls "cognitive interpretation" or "meaning analysis" (i.e., *appraisal*) is the "cold" part of emotion. The "heat" is provided by *arousal*, which according to Mandler, is normally occasioned by the interruption of plans or action sequences. We find Mandler's account more attractive than other arousal/appraisal theories because of its specificity with respect to the appraisal aspect of emotion (see, for example, Mandler, 1982), and because of its explicit recognition of the importance of plans, goals, and knowledge representations. However, Mandler's account has little to say about specific emotions, especially positive ones, and it offers no systematic account of the relation among different emotions.

Another problem with the arousal/appraisal theories is that they offer no account of how arousal and appraisal interact to produce emotion. Our approach to this problem is to postulate an arousal-producing mechanism that, at the same time, registers valence. This obviates the need to postulate distinct mechanisms corresponding to arousal and appraisal, thus eliminating the need to explain how such mechanisms interact for the ordinary experience of emotion. We believe such an approach is viable even though, under special circumstances, it is possible to produce one in the absence of the other (e.g., Schachter & Singer, 1962). Our initial discussion of these issues can be found in Chapter 3.

From a global perspective, it seems that past research on emotion converges on only two generalizations. One is that emotion consists of arousal and appraisal (e.g., Arnold, 1960; Lazarus, Averill, & Opton, 1970; Mandler, 1975; Schachter & Singer, 1962). The other, emerging from the scaling literature (e.g., Abelson & Sermat, 1962; Block, 1957; Davitz, 1969; Engen, Levy, & Schlosberg, 1958; Russell, 1980), is that any dimensional characterization of emotions is likely to include at least the two dimensions of *activation* and *valence*. But, on closer inspection, even these two generalizations appear to be merely two sides of the same coin: The activity dimension can be viewed as the reflection of arousal, and the valence dimension as the reflection of appraisal. Many of the studies that have discovered such relatively simple dimensional structures have been based on judgments about emotion *words*. We suspect, however, that the uncritical use of scaling techniques with emotion words is inappropriate, or at least premature. The problem is that judgments about (the similarity

between) emotion words depend on various, usually uncontrolled (and often uncontrollable) aspects of the stimuli – aspects such as intensity of the corresponding emotions, types of antecedents, types of consequences, and so on. Without knowing to which of these (or other) aspects someone is attending, judgments of similarity are largely uninterpretable. It is partly for this reason, no doubt, that the plethora of multidimensional scaling and factor analytic studies that have been conducted seems only to agree that the major descriptive dimensions of emotions are valence and arousal. We find this conclusion is as uninformative as it is unsurprising.

There have, of course, been numerous attempts to characterize the structure of emotions. They have been developed in different ways, often for different purposes. Theories have been proposed based on all kinds of variables; for example, biological/evolutionary variables (e.g., Plutchik, 1962; 1980), phenomenal variables (e.g., de Rivera, 1977), behavioral variables (e.g., James, 1890), facial expression variables (e.g., Ekman, 1982), and cognitive variables (e.g., Roseman, 1984). Authors have considered such variables to represent the primitive ingredients of human nature, and thus of human emotions. For example, some theorists argue that there is a fundamental opposition between fear and anger because of the underlying approach/avoidance difference. Notice, however, that this difference is rooted in the typical response to these emotions rather than in their causes; when viewed from a causal perspective there may or may not be reason to believe that they are opposed in an important way. An almost universal characteristic of these approaches to emotion is the postulation of a small number of *basic* emotions (typically fewer than ten). Our own view is that the search for and postulation of basic emotions is not a profitable approach. One of our many reasons for saying this is that there seems to be no objective way to decide which theorist's set of basic emotions might be the right one (for a more detailed discussion of this issue, see Chapter 2).

Apart from scaling and arousal/appraisal approaches to emotion, the other main approaches have studied the physiology of emotions and facial expressions. The visceral sensations accompanying emotions and the expressive manifestations of emotions are perhaps the two characteristics that most set emotions apart from other psychological states and events. This may explain why so much research has been concerned with them. The physiological research (see, e.g., Grings & Dawson, 1978; Levi, 1975) is valuable and interesting and may be important for understanding the functions of emotions. However, it does not address questions about the *cognitive* origins of emotions. Such questions are also finessed by the research on facial expressions, with which some of the most impressive research on

emotion has been concerned (e.g., Ekman, Friesen, & Ellsworth, 1982). Insofar as such research is indeed concerned with the *expression* of any particular emotion, it presupposes that the emotion already exists, leaving unaddressed the problem of how it came to be there in the first place.

Types of Evidence for Theories of Emotion

There are four kinds of evidence to which one might appeal in attempting to understand the emotions. First, there is the *language* of emotions, which comes replete with ambiguity, synonymy (or near synonymy), and an abundance of lexical gaps and linguistic traps. Of course, emotions are not themselves linguistic things, but the most readily available nonphenomenal access we have to them is through language. Thus, in order to specify the domain of a theory of emotion it is difficult to avoid using natural language words and expressions that refer to emotions. However, a theory of emotion must not be confused with a theory of the language of emotion. Considerable care needs to be taken in the use to which natural language is put in developing a theory of emotions. Not all distinct emotion types necessarily have associated words in any particular language, and not all the emotion words that refer to emotions in some particular language necessarily refer to distinct ones. The absence of a word in one language to designate the particular emotion that might be referred to by a word in another does not mean that people in cultures using the first language cannot and do not experience that emotion (Wierzbicka, 1986). Such linguistic gaps can be filled through catachresis and metaphorical descriptions, although the latter are often used even in cases where the language does provide a word for the particular category of emotion, but where one seeks to communicate the particular *quality* of an instance of the category (Fainsilber & Ortony, 1987). For some categories of emotions, a language like English provides a relatively large number of tokens, thus reducing the need for metaphorical descriptions of emotional quality. In such cases, it becomes necessary to identify one of the words in the category as the unmarked form or category label. For example, *fear* has lexical realizations that mark special cases such as very strong fear ("terrified"), very weak fear ("worried"), typical fear-induced behaviors ("cowering") and so on. Thus, it may be helpful to think of the word "fear" as a relatively neutral word for an emotion type, fear. In other words, one can view the word "fear" as designating a distinct emotion type (whereas the word "terrified" does not). This is quite consistent with a subsequent fine-grained analysis that might examine what exactly the different tokens for the same emotion type do distinguish, and why. However, our ultimate goal is not to *define* emotion words such as "fear" but to

specify, in as language-neutral a manner as possible, the characteristics of distinct emotions. Language, therefore, is a source of evidence that has to be used with considerable care. We will assume that the words in our common language reflect a number of important distinctions, that they reflect a number of not so important distinctions, and that sometimes they fail to reflect important distinctions at all. Some of these issues will be discussed in Chapter 9. We have also discussed them at length elsewhere (e.g., Clore, Ortony, & Foss, 1987; Ortony & Clore, 1981; Ortony, Clore, & Foss, 1987).

The second kind of evidence is evidence from *self reports* of experienced emotions. There is as yet no known objective measure that can conclusively establish that a person is experiencing some particular emotion, just as there is no known way of establishing that a person is experiencing some particular color. In practice, however, this does not normally constitute a problem because we are willing to treat people's reports of their emotions as valid. Because emotions are subjective experiences, like the sensation of color or pain, people have direct access to them, so that if a person is experiencing fear, for example, that person cannot be mistaken about the fact that he or she is experiencing fear. This is not to deny that the person might be mistaken about some relevant aspect of the world that is the *cause* of the fear (for example, about the threat that the feared event poses), or that the person may not be able to express the emotion in words (as in the case of a small child frightened by a dog). Yet, in normal cases, we treat self reports of emotions as valid. To be sure, we sometimes evaluate the reported emotions of others, but when we do, we evaluate them as being appropriate or inappropriate, or justifiable or unjustifiable, not as being true or false. Furthermore, these evaluations are invariably based on our own intuitions about the conditions under which different emotions can and do normally arise. Consequently, in the scientific study of emotions it is not unreasonable to appeal to our intuitions about what emotional states are typically produced by situations of certain kinds. Clearly, it is possible to determine whether or not such intuitions are shared by others, even if verifying the empirical accuracy of such intuitions, widely shared as they may be, is more problematical. In some cases, therefore, one has to take note, albeit cautiously, of shared intuitions about emotions. Of course, if a person does not share the consensual meanings of emotion terms, or is emotionally abnormal, or is simply being deceitful, then his or her self reports may well be invalid, but such exceptions presuppose a background of reliable reporting for their relevance.

This raises the question of the difference between scientific and folk theories of emotions. It might be argued that just as people's naive theories

of certain physical phenomena bear no necessary relation to the scientific theories that account for those phenomena, so the folk theories of emotion that underlie our evaluations of the emotions of others bear no necessary relation to a scientific theory of emotion. However, the study of emotions is not like the study of physics. The phenomena that naive physics organizes are phenomena external to the judging system, but the phenomena that a folk theory of emotions organizes are subjective experiences that are part of the judging system – their veridicality is not an issue. A person who is afraid ordinarily knows that he is afraid, and he ordinarily knows that his fear is caused by the prospect of some sort of threat. That is what fear is in our culture. If this is a naive theory of fear, it has a quite different status from, for example, a naive theory of motion, an example of which would be the belief that a projectile emitted from a coiled tube will continue in a spiral trajectory that gradually straightens out (McCloskey, 1983). The status of the fear theory is different not merely because the fear theory is essentially correct while the motion theory is not, but because its correctness is guaranteed in much the same way as is the correctness of grammaticality judgments of native speakers of a language. Linguists and psycholinguists assume that native speakers have a *tacit* knowledge of the grammar of their language that is difficult or impossible to articulate. An important part of the linguist's job is to discover the grammar by making explicit the implicit principles embodied in the normal linguistic experience of native speakers. Similarly, we maintain that an important part of the psychologist's job is to discover the "grammar" of emotions by making explicit the implicit principles embodied in normal emotional experience.

So far, we have reviewed two kinds of evidence available to emotion theorists: language and self reports. We turn now to the third kind, namely, *behavioral* evidence. We shall play down this aspect of emotions for reasons that relate to the nature of our goals. Perhaps initially stimulated by William James's claim that the emotions *are* the bodily responses, research on emotions during the behaviorist and postbehaviorist era has been dominated by approaches based on the characteristic behavior associated with the emotions. Our view is that although it is important to identify characteristic behaviors associated with individual emotions, it is not often that these behaviors actually *constitute* an emotion, although, as has been observed by other theorists (e.g., Frijda, 1987; Lang, 1984), in many cases action *tendencies* might be properly construed as part of a total emotional experience. We prefer the view that actual behavior is a response to an emotional state in conjunction with the particular initiating event. All kinds of factors, many having little if anything to do with the emotions, determine whether some particular behavior actually occurs. For example, people often reject

possible courses of action in response to an emotion if they believe that the intended goal will not in fact be achieved by them. On the other hand, we consider it important to emphasize that emotions are important determiners of motives. Since, ordinarily, there is a nonrandom connection between motives and behavior, our theory ought to be capable of accounting for certain classes of behaviors in terms of certain emotions (together with other determining factors). This, however, is not the same as predicting specific behaviors in connection with specific emotions. In general, the problem with concentrating on behavior when considering the emotions is that the same behavior can result from very different emotions (or even from no emotion at all), and that very different behaviors can result from the same emotion.

Whereas we see serious problems associated with the general use of specific behaviors as evidence in the study of emotions, we are more sympathetic to the notion (e.g., Arnold, 1960; Frijda, 1987) that different emotions involve different associated action *tendencies*. However, we remain unconvinced that this is a characteristic of *all* emotions, and if it is not, then action tendencies would turn out merely to be concomitants (albeit high frequency ones) of emotions. Our reservations over the necessity to incorporate action tendencies as part of emotions is that we find the analysis quite strained in the case of many positive emotions (e.g., happiness, relief), and even in the case of some negative ones (e.g., grief). We should make it clear that we do not intend to deny that, for example, smiling frequently accompanies happiness, or that weeping frequently accompanies grief. Our point does not pertain to involuntary reflexlike expressions of emotions but rather to the more voluntary actions that follow on the heels of emotions. We think the attention to action and action tendencies is a legacy from treating anger and fear and their associated reflexes of fight and flight as prototypes of emotions. In the general case, we think that action tendencies are neither necessary nor sufficient for emotions. We think they are not necessary because emotions (such as admiration) that are rooted in standards, for example, rather than in goals are not coherently characterized in terms of action tendencies in relation to changing goal priorities. We think they are not sufficient because it is perfectly possible for there to be action tendencies without associated emotions. For example, realizing that a house plant needs to be watered may lead to the action (tendency) to water it, but the antecedent perception is hardly an emotion. Our conclusion, therefore, is that action tendencies may be typical, and for some emotions even normal, but they cannot be constitutive of all emotions.

The fourth kind of evidence is *physiological*. Our view is that whereas

the physiological concomitants of emotional experiences are of indisputable importance, they throw relatively little light on the cognitive components of emotion, which is the focus of our work. Thus we do not feel obliged to take sides in the debate about whether there is a unique pattern of physiological activity (of the sympathetic nervous system) associated with each specific emotion, because patterns of physiological activity are not directly relevant to the cognitive antecedents of emotions. There may or may not be unique patterns; the issue remains an open and empirical question (see Lazarus, Kanner, & Folkman, 1980). To believe, however, that the importance of the cognitive determinants of emotions is in any way contingent on the final resolution of this issue (should there ever be one) is to misunderstand the nature of the cognitive claim.

Some Goals for a Theory of the Cognitive Structure of Emotions

We share Abelson's (1983) view that an analysis of emotion must go beyond differentiating positive from negative emotions to give a systematic account of the qualitative differences among individual emotions such as fear, envy, anger, pride, relief, and admiration. One way of assessing the various approaches to emotion is to determine how adequately they accomplish this task. A number of interesting studies have focused on individual emotions or on small groups of emotions. For example, Averill (1982) studied anger, Mowrer (1960) looked at hope, fear, disappointment, and relief, and Epstein (1967) and Spielberger (1972) represent but two of the many who have studied anxiety. Such accounts, however, tend not to consider the emotions they investigate in the context of a larger, more comprehensive system, and they have not led to widely accepted conclusions about emotions in general. The more system-level arousal/appraisal theories (e.g., Arnold, 1960; Lazarus, Kanner, & Folkman, 1980; Mandler, 1975; 1984) have a better chance of success but generally tend to be weak when faced with the problem of differentiating distinct emotions. Furthermore, they are often based on a narrow range of (frequently only negative) emotions. However, such problems are not, we think, endemic to system-level approaches. Indeed, our own theory is essentially an arousal/appraisal theory, yet we think it does not suffer from these limitations.

One of our main goals is to present an approach to the study of emotion that explains how people's perceptions of the world – their construals – cause them to experience emotions. We consider two questions to be central to this enterprise. The first is "What is the cognitive structure of the emotional system as a whole?" The second main question is "What is the cognitive structure of individual emotions?" Our approach to the first of these questions is to try to show the relationships that exist among the individual emotions in groups of related emotions. The general answer we propose is that the emotions are best represented as a set of substantially independent groups based on the nature of their cognitive origins. Our response to the second question is based on the assumption that the particular emotion a person experiences on some occasion is determined by the way he construes the world or changes in it. Thus we attempt to specify both the eliciting conditions for the distinct emotions and the variables that influence their intensity. Insofar as a definition of emotion presupposes a theory, the adequacy of the definition we propose will ultimately depend upon the adequacy of the theory. Our working characterization views emotions as *valenced reactions to events, agents, or objects, with their particular nature being determined by the way in which the eliciting situation is construed.*

We believe that our two key questions concerning the overall structure of the emotion system and the nature of the individual emotions are related in important and hitherto unexplored ways. In order to address them, it is important to distinguish between those affective states, and other mental conditions, that are genuinely emotional and those that are not (Clore, Ortony, & Foss, 1987; Ortony, Clore, & Foss, 1987). This issue is neglected by most existing theories, perhaps because it is not appropriately considered as part of a theory of emotion as such. Be that as it may, we consider a treatment of the issue to be essential for any theory of emotion because it delimits the range of phenomena that need to be explained.

We have structured this book in a way that presents first the ideas that constitute the core of the theory that we are proposing. Thus we start in Chapter 2 with a presentation of the overall structure of the theory. We argue that there are three broad classes of emotions that result from focusing on one of three salient aspects of the world – events and their consequences, agents and their actions, or objects, pure and simple. Having laid out this general structure we turn in Chapter 3 to a discussion of the appraisal mechanism. This requires us to make some proposals concerning the macrostructure of people's knowledge representation. In particular, we discuss the nature of an organization scheme that might allow one to distinguish three major ingredients of appraisal. These are goals, standards, and attitudes, and they constitute respectively the criteria for evaluating events, the actions of agents, and objects. Because our analysis of individual emotions involves specifying the variables that influence their intensity, the second part of Chapter 3 and all of Chapter 4 are devoted to a discussion of the key factors that we see as affecting the intensity of emotions. This is an important issue for us because a major part of our claims about the overall structure of emotions is that groups of emotions tend to have the same

variables affecting their intensity, and that many of these variables are local in the sense that they do not affect the intensity of emotions in other groups. Having provided the background concepts, Chapters 5 and 6 are concerned with our detailed analyses of the Event-based emotions, that is, of the emotions for which the underlying appraisal is based on goals. Chapter 7 is devoted to the Attribution emotions, namely those that attribute responsibility to the agents of actions in terms of standards, and Chapter 8 provides a brief survey of some of the issues surrounding the Attraction emotions, which are ultimately rooted in attitudes. Finally, Chapter 9 attempts to provide some criteria for the question of what is to count as an emotion and discusses a number of implications of the theory including, in particular, a discussion of how our proposals might, in principle, be formalized into a computationally tractable model.

Summary

Our goal is to construct a cognitive theory concerning the origins of the emotions. In particular, we want to specify the global structure interrelating different emotions as well as the characteristics of individual emotions. The global analysis breaks emotions into three general classes: reactions to events, agents, and objects. The analysis of individual emotions specifies the eliciting conditions for each emotion and the variables that affect the intensity of each emotion.

There are four main kinds of evidence about the emotions: language, self reports, behavior, and physiology. The latter two kinds of evidence concern the consequences or concomitants of emotional states, but not their origins, which we think are based upon the cognitive construal of events. For this reason we largely ignore behavioral and physiological evidence, focusing instead on language and self reports. Although we do take linguistic evidence into account, our analysis of emotions is not to be taken as a theory about emotion words. Rather, it attempts to specify different types of emotions. In many cases ordinary language has several words that refer to different aspects of the same underlying emotion type. For example, English has many words that refer to different levels of intensity or to the behavioral consequences of fear, but ultimately, all refer to the same underlying emotion type. Our account of emotions is in terms of classes of emotion types, such as these, and not in terms of specific words. It is an exercise in theoretical psychology, but one that we think can be tested empirically.

2 The Structure of the Theory

In discussing the merits and dangers of using linguistic evidence, the last chapter introduced the notion of an *emotion type*. An emotion type is a distinct kind of emotion that can be realized in a variety of recognizably related forms. The example we gave was of the emotion type, *fear*, which can be manifested in varying degrees of intensity (marked in English by words such as "concern," "fright," "petrified," and so on), and for which there can be various subtle shifts in emphasis (for example, an emphasis on a particular kind of associated behavior is captured by the word "cowering," and an emphasis on the object of fear as being psychological rather than physical is captured by the word "anxiety"). This notion of an emotion type is central to the theory. In order to provide a coherent account of the emotions, it is essential to reduce somehow the infinitude of phenomenally possible emotions to manageable proportions. We do this by focusing on the distinct emotion types rather than on the multitude of discriminable emotional states. The question that we then have to address is: What are the distinct emotion types and how are they related to one another?

It seems to us that the distinct emotion types cannot be arranged informatively into any single space of reasonably low dimensionality. Rather, we suspect that the emotions come in groups for which the intragroup structure is quite simple even though the intergroup structure is not (Fillenbaum & Rapaport, 1971). We shall therefore proceed by trying to identify and characterize representative groups or clusters. Each group is structured so that the definition of each cell in the group provides a specification of an emotion type that incorporates the *eliciting conditions* for the emotion in that cell. That is, it incorporates a situational description of the conditions under which the emotion can be triggered.

The groups of emotions that we identify have two important characteristics. First, emotions in the same group have eliciting conditions that are structurally related. For example, one of the groups that we propose, the

"Attribution Group," contains four emotion types, each of which depends on whether the attribution of responsibility to some agent for some action is positive or negative, and on whether the agent is the self or some other person (see Chapter 7). The eliciting conditions for each of the four emotion types are thus structurally related, involving only different bindings of the variables for identity of agent and valence of attribution. The second important characteristic of emotion groups is that each distinct emotion type represented in them is best thought of as representing a family of closely related emotions. The emotions in each family are related by virtue of the fact that they share the same basic eliciting conditions, but differ in terms of their intensity and sometimes in terms of the weights that are assigned to different components or manifestations of the emotions (e.g., behavioral components).

Another aspect of the theory is that the characterization of each emotion type includes a specification of the principal variables that affect its intensity. These variables are local to particular groups, and have to be distinguished from what we call "global" variables, which can influence the intensity of emotions in all groups. An important guiding principle in developing the theory was that it be sufficiently specific to permit empirical testing. Although we shall not discuss them in this book, there are two general methods of testing that we use. One involves the use of experimental studies relying primarily on evidence from self reports. The other involves the use of computer simulations. Experimental studies allow us to determine the validity of the groups that we propose. They allow us to determine whether, as they take on different values, the principal variables represented in the eliciting conditions really do give rise to phenomenally distinct emotions, and they allow us to determine whether or not the local intensity variables that we hypothesize as being related to individual emotions really do affect the intensity of those emotions. Many of the studies that we conduct to investigate these issues are studies in which we tap people's intuitions about the emotions they would expect others to experience under various conditions (e.g., Clore, Foss, Levine, & Ortony, in preparation). In such studies we systematically manipulate the underlying characteristics of the described conditions and the variables thought to influence intensity and then look for intersubject agreement about which emotions they think would be experienced, and with what intensity. It is relatively easy to collect data on a full range of emotions using such techniques because it is not necessary to create or wait for appropriate real-world situations to arise—for some emotions, such as grief, there are other factors that mitigate against using real-world emotions. However, it is

clearly desirable to show that the proposed theory also describes adequately the emotions of individuals *as they experience them*. To this end some of our investigations have explored emotions under conditions that are ecologically more valid.

Two particular lines of our empirical research have been concerned with the emotions experienced by individuals as opposed to the emotions they impute to others. One of these uses an automated diary technique. In one application of this method (see Turner, 1987), subjects responded on an almost daily basis for two months to a detailed computer-administered questionnaire about emotions experienced in the preceding 24-hour period. This enabled us to examine a wide range of questions about variables affecting the elicitation and intensity of over 40 emotion tokens. A second approach investigates the experienced emotions of fans witnessing sports events. In these studies we ask subjects to identify the emotions that they are experiencing from time to time while watching basketball games. We also solicit from them information about the intensity of their reported emotions and about factors that we predict ought to be influencing what particular emotions they are experiencing, and with what intensity. As the data from such studies come in, it is quite possible that we shall find ourselves being forced to change certain aspects of the theory, and to the extent that this is so, we do not view what we present in the following pages as the last word. It may well be that the theory will require serious repair, or even that it will have to be abandoned. Yet, we think that even in this worst case, it will have been worth presenting. The point of what we propose is not that we think it is the right answer, but rather that we think it is the right approach. There must be some cognitive principles underlying the experience of emotions, and we are simply proposing an approach to thinking about what they might be.

A quite different technique for exploring the validity of the kind of theory we are proposing is to employ the tools of Artificial Intelligence in an attempt to model the theory. The point of such an enterprise is not to create machines with emotions—we think that such an endeavor would be pointless and futile—but to create a computer model that can "understand" what emotions people would be likely to experience under what conditions. Such a system should be able to predict and explain human emotions, not have them. To the degree that the predictions and explanations of a computer system match those of humans one can have confidence that the system embodies a reasonable model of the cognitive origins of emotions. Another virtue of exploring a theory such as ours through the use of a computer model is that one can experiment with the model by manipulat-

ing its parameters and examining the consequences of such manipulations to see whether or not they are reasonable. This degree of control is difficult and sometimes impossible to achieve in experimental laboratory settings.

The Organization of Emotion Types

In presenting the overall structure of our account of emotion types, we start with the least contentious assumption that we can, an assumption not about emotions as such, but about the ways in which people (at least in our culture) can perceive the world. The assumption is that there are three major aspects of the world, or changes in the world, upon which one can focus, namely, *events, agents,* or *objects.* When one focuses on events one does so because one is interested in their consequences, when one focuses on agents, one does so because of their actions, and when one focuses on objects, one is interested in certain aspects or imputed properties of them *qua* objects. Central to our position is the notion that emotions are valenced reactions, and that any particular valenced reaction is always a reaction to one of these perspectives on the world. We are perfectly willing to admit that different organisms, or people in different cultures, might carve up the world in different ways. If they do, then there would be corresponding changes in the emotion types that they could experience. Thus if, for example, certain animals are biologically and cognitively limited to attending only to events and their consequences, then the only emotion types that they will be able to experience are those associated with reactions to events.

Before discussing the overall structure of the theory, it will be helpful to clarify what we have in mind in distinguishing agents, objects, and events. Our conception of events is very straightforward–events are simply people's construals about things that happen, considered independently of any beliefs they may have about actual or possible causes. Our notion of focusing on objects is also quite simple. Objects are objects viewed *qua* objects. This leaves us with agents, which are things considered in light of their actual or presumed instrumentality or agency in causing or contributing to events. Agents are not limited to people, even though they are the most usual manifestations. Agents can be nonhuman animate beings, inanimate objects or abstractions, such as institutions, and even situations, provided they are construed as causally efficacious in the particular context. When objects are construed as agents, they are just that–objects *construed as* agents. So, for example, a person who buys a new car that turns out to be a constant source of trouble might blame the car for his series of misfortunes. In doing so, however, he would be treating the car as though it were an
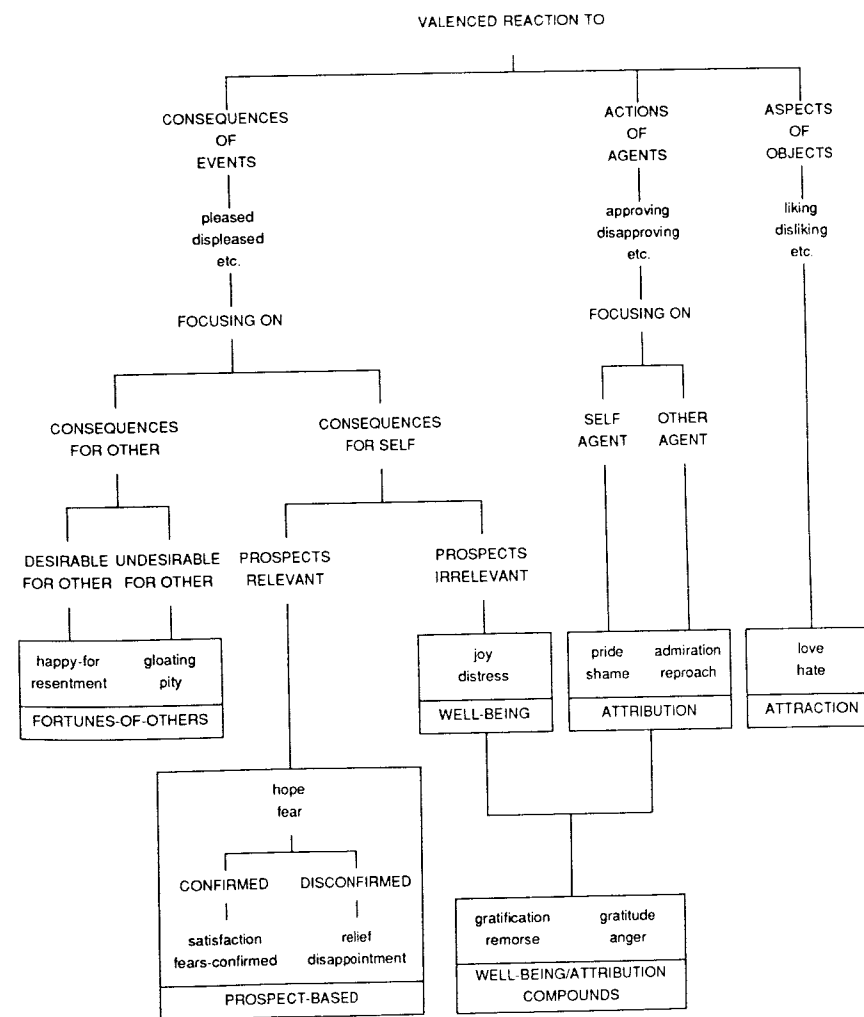

Figure 2.1. Global structure of emotion types.

agent, rather than simply as an object. In treating it as an agent, he could disapprove of it. Were he to treat it only as an object, his affective reaction to it would be one of dislike.

The overall structure that we propose is illustrated in Figure 2.1, where the three main branches correspond to the three ways of reacting to the world. It is important to realize that this structure is intended to be interpreted as a *logical* description, not as a temporal one. Each branch, that is,

each of the three kinds of things to which one can have valenced reactions, is associated with a broad class of affective reactions. Whether or not these affective reactions are experienced as emotions depends upon how intense they are, which is one of the reasons why it is important to know what factors affect the intensity of what emotions. This issue is addressed in detail in the second part of Chapter 3 and in Chapter 4. The first broad class comprises all the emotion types indicated in the left hand branch of the figure. This general class of affective reactions we have indicated as those of being *pleased* and *displeased*. We should say immediately that the choice of these words here (and of comparable words elsewhere in the structure, indicated in lower case letters) is not critical. They are intended only as convenient reminders for the corresponding locations in the structure. Thus, they really serve the function of technical terms that are defined by the role they play in the proposed structure. For example, the particular words "pleased," and "displeased," simply represent the best we can do to find relatively intensity-neutral English words that refer (only) to the undifferentiated affective reactions one can have to events and their consequences. These affective reactions arise when a person construes the consequences of an event as being desirable or undesirable, so that judged *desirability* (including undesirability) is the most important, or the *central*, variable that affects the intensity of all these Event-based emotions. This means that desirability (which, as will be discussed in Chapter 4, also has to be taken as a technical term) is the main criterion for evaluation. The second general class of affective reactions is shown in the middle branch of the figure as being those of *approving* and *disapproving*. When these reactions are sufficiently intense they lead to a group of emotions that we call the Attribution emotions. These are caused by reactions to the actions of agents, when they are viewed as being either praiseworthy or blameworthy, making judged *praiseworthiness* (which we take to include blameworthiness) the primary basis for evaluation. Finally, the third general class comprises the essentially unstructured affective reactions of *liking* and *disliking*. The associated emotions here are the Attraction emotions, which are caused by reactions to objects, or aspects of objects, in terms of their *appealingness*. As mentioned above, we are using a broad sense of "object" here, a sense in which an object can be animate or inanimate, concrete or abstract.

To see how, in general, focusing on events, agents, and objects leads to different classes of emotional reactions, we shall consider a highly oversimplified example of the reactions a person might have upon learning that his neighbor is a merciless child-beater. If such a person focuses only on the neighbor's role as the *agent* of child-beating, judging it as blameworthy

because of its violation of certain standards, his valenced reaction towards the neighbor could be realized as an Attribution emotion such as reproach or contempt. The person could also focus on one or more aspects of a child-beating *event*. If he focuses only on its undesirability it might cause him distress. He could also focus on the plight of his neighbor's children and experience pity. Finally, the person might focus on his neighbor *qua* (unappealing) *object*, giving rise to an Attraction emotion such as hatred. Clearly, this *is* a highly oversimplified picture. In reality, the person is likely to experience a mixture of emotions resulting from considering the situation from these different perspectives at different moments so that some of the resulting emotions may cooccur and some will occur in sequences. However, we have presented this example only in order to explicate the effects of focusing on different aspects of an emotion-inducing situation. It was not presented for the purpose of analyzing exactly what emotions would occur in what mixtures or sequences.

We can now return to discussing Figure 2.1. In interpreting the figure, notice that some of the labels are in upper case and some in lower case. Labels in upper case represent structural elements, whereas those in lower case represent emotional, or potentially emotional, states. Individual groups of emotion types are enclosed in boxes with the name we have chosen for each group indicated in the panel at the bottom of each box. Representative names for the emotion types are shown in lower case. In all cases where we have indicated emotion types, the particular words have been chosen only as suggestive labels for entries for that position in the structure. Thus, the structural descriptions that they represent are not intended to be taken as definitions of them.

We start by introducing the distinctions and associated emotions relating to reactions to events and their consequences. This branch includes emotion types that can be loosely thought of as *pleased* and *displeased*, *joy* and *distress*, *hope* and *fear*, *relief* and *disappointment*, *pity* and *resentment*. All of these emotions, reachable from the CONSEQUENCES OF EVENTS branch, are reactions of the experiencing person to the implications of events for the person experiencing the emotion. This branch of the emotion tree in the figure is the most complex. The first potentially emotional states to be encountered are shown, before the branch divides, as being *pleased* and *displeased*. Thus being *pleased* and *displeased* are intended to refer to relatively undifferentiated affective states that are nonspecific in the sense that they are nothing more than valenced reactions to *events* (as opposed to *agents* or *objects*). A consequence of this is that all emotion nodes below the *pleased/displeased* node are differentiated instances of being pleased or displeased. Being *pleased* and *displeased* seem to be rather pale when

considered as labels for emotions. One reason for this is that they lack the specificity that is characteristic of typical emotional states. A second reason is that we have purposely chosen rather neutral terms to indicate these states–that is, terms that do not strongly imply a particular level of emotional intensity.

The structure that falls below the *pleased/displeased* node divides first according to whether the person who experiences the emotions is reacting to the consequences of the focal event with respect only to himself, or also with respect to some other person. This distinction is represented by the two main branches labeled CONSEQUENCES FOR SELF and CONSEQUENCES FOR OTHER. Consider first the CONSEQUENCES FOR SELF branch. This branch leads to two groups of emotions. For one of these groups the consideration of the *prospect* of an event is crucial and for the other it is irrelevant. The emotions for which the consideration of the *prospect* is irrelevant are simply those that result from positive or negative reactions to the events that affect one. They reflect upon one's well-being, and are in fact simply default cases of being pleased and being displeased. Such emotions are usually referred to in English by words like "happiness," "joy," "unhappiness," "sadness," and "distress." However, as will be discussed in Chapter 5, where these emotions are dealt with in detail under the rubric of the "Well-being" emotions, the situation is somewhat more complicated than this. Specifically, a number of emotions will be assigned to this category that are quite particular in content–emotions such as grief and regret. The reason we consider such emotions to be specific kinds of distress is that they appear to differ from distress only in that they involve more specific events about which the experiencing person is displeased. So, for example, grief is not just a generalized form of being displeased at an undesirable event; the undesirable event is a more specific one comprising the loss of a loved one.

The branch marked PROSPECTS RELEVANT includes first the emotions of *hope* and *fear*. These emotions result from reacting to the prospect of positive and negative events respectively. Four additional emotions arise depending upon whether the prospect of a positive or negative event is believed to have been confirmed or disconfirmed. These four emotions are shown as "satisfaction," "disappointment," "relief," and an emotion that for want of a better name we call "fears-confirmed." This entire group of six emotion types we refer to as the "Prospect-based" emotions. They are discussed in detail in Chapter 6.

The final group of emotions that we propose under the Event-based emotions are those appearing under the CONSEQUENCES FOR OTHER branch. These are emotions that result from reacting to the consequences of events when focusing on the consequences for others. This group of emotions we refer to as the "Fortunes-of-others" group, and it contains four distinct emotion types. The emotions represent the reactions to events that a person can have when the events are desirable or undesirable relative to the goals and interests of another person. The branch marked DESIRABLE FOR OTHER leads to emotion types that we refer to as "happy-for" and "resentment," while the branch labeled UNDESIRABLE FOR OTHER leads to "gloating" and "pity." Thus, for example, under suitable conditions, when an event is undesirable for some other person but is for that reason desirable for the person experiencing the emotion, that person can experience the emotion of gloating, or *Schadenfreude*, whereas if the experience of that undesirable event by the other person is (also) undesirable for the experiencer, the possibility of the emotion of pity arises. The way in which the figure should be interpreted with respect to, for example, gloating is that gloating is the valenced reaction to an event characterized by being pleased that some event is undesirable for another person. This illustrates the way in which we view the emotions below the *pleased/ displeased* node to be differentiated cases of being pleased or displeased. All the emotions in this Fortunes-of-others group are discussed in detail in the second part of Chapter 5.

The second main set of emotions are those emanating from the middle branch of the figure. This branch, labeled simply, ACTIONS OF AGENTS, represents emotions having to do with people's reactions to the agency that they attribute to agents. Basically, these emotions are differentiated forms of the affective reactions of *approving* and *disapproving* of an agent's actions. The figure shows these "Attribution" emotions splitting into two, depending on whether the approval or disapproval focuses on the self as agent (labeled SELF AGENT) or on some other as agent (OTHER AGENT). When the formal agent is the self, the emotion types of *pride* and *shame* can arise. When some other person is the formal agent, the emotion types of *admiration* and *reproach* can arise. A crucial aspect of these emotions has to do with the way in which the notion of the self is conceptualized. In order to account for the fact that Attribution emotions, such as pride, can result from the actions of others, an extended notion of the self is required in which the self can be the formal agent while the actual agent is some other person with whom one views oneself as being in a cognitive unit (Heider, 1958). This issue, and others concerned with the Attribution emotions, is discussed in detail in Chapter 7.

The rightmost branch of the figure shows a structureless group of emotions resulting from reactions to objects *qua* objects. These emotions, which we call the "Attraction" emotions, are all variations of the affective

reactions of *liking* and *disliking*. Thus, they represent undifferentiated affective and aesthetic reactions to objects, for which *love* and *hate* are good examples. We do not wish to imply that objects construed in this way are necessarily construed independently of their agency, but rather that it is the object *qua* object, not the object *qua* agent, that is the focus of the evaluation. In fact, because of the psychological difficulty of separating agents from their actions, there is a strong tendency for Attraction emotions such as hatred to cooccur with compatible Attribution emotions such as contempt. It is important to emphasize at this point that we view the Attraction emotions as being *momentary* in nature, rather than enduring dispositions towards objects. Our intention is to focus on the momentary *state* of, for example, loving or hating somebody or something. The way in which dispositional evaluation is constructed out of individual experiences is primarily a problem to be handled by a theory of impression formation and personal attraction, not by a theory of emotion, although we do discuss it briefly in Chapter 8.

The figure also shows a branch leading out of the Well-being emotions and a branch leading out of the Attribution emotions both converging on a group of emotions labeled "Well-being/Attribution compounds." These compound emotions include those labeled as *gratification, gratitude, remorse,* and *anger,* and they have the property that they arise from simultaneously focusing on both the action of an agent *and* the resulting event and its consequences. We call them compounds because they involve more than the mere cooccurrence of their corresponding constituent emotions. Gratitude is not simply the cooccurrence of admiration for an agent and happiness at a resulting desirable outcome. It is a unified emotion in which the constituents need not necessarily be independently experienced. A detailed discussion of these emotions is presented in the second section of Chapter 7.

A major feature of the scheme that we have outlined is that some of the factors that affect the intensity of emotions are specific to particular groups of emotions. In general, as we shall discuss in more detail in Chapter 4, progress down the structure shown in the figure tends to result in the introduction of variables that affect the intensity of all the emotions lower down (see Figure 4.1). We mentioned three such variables in introducing the three main branches when we said that events and their consequences are evaluated in terms of their *desirability*, actions of agents in terms of their *praiseworthiness*, and aspects of objects in terms of their *appealingness*. Desirability, praiseworthiness, and appealingness are all variables that influence the intensity of all the emotions below the point at which they are introduced, so that, although each is central to a distinct class of

emotions (Event-based, Attribution, and Attraction emotions, respectively) their effects are local to collections of emotions. At the same time, as will also be discussed in Chapter 4, there are a number of variables such as *unexpectedness* that have global rather than local effects on intensity.

One final aspect of the overall structure that we are proposing is that there seems to be an interesting tendency for emotional reactions to develop in a left-to-right manner with respect to the structure shown in the figure. To the extent that this is true, it might be because the most salient initial experience is that some event transpires; this would constrain the emotional reaction to an Event-based one. At the same time, however, one may seek to understand the causal origins of the event, so that an Attribution emotion becomes a possibility. Finally, because inferences about the properties of (animate) objects are made on the basis of their actions, Attribution emotions may give rise to momentary reactions of liking or disliking of agents *qua* objects. A more detailed discussion of this conjecture is presented in Chapter 8.

Basic Emotions

Although we embrace the notion of emotion types, we are inclined to reject the idea that there is a set of "basic" emotions such that they, together with their combinations, account for all the emotions (views aptly referred to by Scherer, 1984, as "palette theories"). At first sight, the thesis that there are basic emotions is not an implausible one. Surely there are too many emotions for all to be distinct and equally basic. As in the physical world of, say, chemical elements versus chemical compounds, it would not be unreasonable to suppose that the phenotypical emotions are based on a smaller number of genotypical or primary emotions. Such a conception seems parsimonious. Having said that, however, one has to be able to answer a number of difficult questions. First, it is by no means obvious what the claim that there are basic or primary emotions is supposed to mean. Does it mean that such emotions are universal? Does it mean that they form emotion compounds or blends, or emotion mixes? Does it mean that they should appear developmentally before other (nonbasic) emotions? A second problem is that whatever answers one might propose for such questions, it does not follow that one needs a concept of basic emotions. Some emotions, such as happiness, sadness, anger, and fear, could perfectly well be (and probably are) found in all cultures, without their being basic in any other sense (toe nails might be found in all cultures too, but that would not be sufficient to render them anatomically basic). Such emotions could also combine with other emotions without that necessitat-

5　Reactions to Events: I

Having now dealt with the background issues, we move to our discussion of the distinct emotion types. We start by discussing the three main groups of emotions that involve reactions to events relative to one's own goals. The emotions in one of these groups result from considering the *prospect* of certain events occurring. These Prospect-based emotions will be discussed in Chapter 6. In this chapter we shall examine the other two groups of Event-based emotions, in which people's emotional reactions to events are more or less independent of their prior expectations. One of the groups that we shall discuss pertains to the fortunes of others and the reactions that one has to them. But first, we shall discuss what we call the "Well-being" emotions, with "joy" and "distress" being representative terms that refer to them. In distinguishing Well-being emotions from Prospect-based emotions, we do not intend to suggest that the degree to which events are unexpected is irrelevant for the Well-being emotions. Unexpectedness influences the intensity of all emotions. However, the Well-being emotions result from focusing attention on the events themselves rather than on events as tempered by the *prospect* of their occurring. As suggested in Chapter 2, these emotions are essentially "pure" cases of being pleased or displeased.

The Well-being Emotions

The internal structure of the Well-being emotions is quite simple. However, associated with this group of emotions is a great variety of lexical items, as a result not of internal structure in the sense of dimensions, but rather as a result of the fact that a large number of specific words refer to changes in well-being resulting from specific kinds of events.

The Well-being emotions should not be viewed merely as affective evaluations of something as positive or negative. They are paradigmatic psychological states of feeling that arise from attending to events insofar as they

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Table 5.1. *Well-being emotions*

APPRAISAL OF EVENT	
DESIRABLE	UNDESIRABLE
pleased about a desirable event (e.g., joy)	displeased about an undesirable event (e.g., distress)

are appraised as being desirable or undesirable. Sometimes the events are in the remote past (cf. nostalgia), sometimes they are in the recent past or are concurrent with the emotion (cf. grief), and sometimes they are future events, as might be the case in the joy a couple might experience on learning that they are going to have a baby. In the case of a future event such as this, care has to be taken to distinguish Well-being emotions from the Prospect-based emotions, such as hope, that might also arise.

The main factor affecting the intensity of the Well-being emotions is the degree to which the event in question is appraised as being desirable or undesirable (see Chapter 3). In general, to the extent that the person sees the object as contributing to the realization of his goals, he will tend to experience the positive emotion of the kind that we call *joy*. Similarly, to the extent that the person sees the object as interfering with the realization of his goals, he will tend to experience the negative emotion of the kind that we call *distress*. Whether or not these are exactly the right words is not important for the moment. What is important is that the Well-being emotions, whatever we call them, are the result of reacting to events that are positively or negatively evaluated in terms of their implications for a person's goals (including, as already discussed, Active-pursuit goals, Interest goals, and Replenishment goals).

In keeping with the format that we shall use to represent the different groups of emotions, the Well-being emotions are represented in Table 5.1. The table presents abbreviated structural descriptions of the emotions. Each of these abbreviated descriptions has associated with it a more formal and complete characterization that we call an "emotion specification." The structure of these specifications can best be understood by considering the cases of those for the Well-being emotions, whose relatively simple structure provides a transparent model of the way in which we characterize emotion types:

(5.1)   **JOY EMOTIONS**
TYPE SPECIFICATION: (pleased about) a desirable event
TOKENS: contented, cheerful, delighted, ecstatic, elated, euphoric,

feeling good, glad, happy, joyful, jubilant, pleasantly surprised, pleased, etc.
VARIABLES AFFECTING INTENSITY:
(1) the degree to which the event is desirable
EXAMPLE: The man was pleased when he realized he was to get a small inheritance from an unknown distant relative.

(5.2)   **DISTRESS EMOTIONS**
TYPE SPECIFICATION: (displeased about) an undesirable event
TOKENS: depressed, distressed, displeased, dissatisfied, distraught, feeling bad, feeling uncomfortable, grief, homesick, lonely, lovesick, miserable, regret, sad, shock, uneasy, unhappy, upset, etc.
VARIABLES AFFECTING INTENSITY:
(1) the degree to which the event is undesirable
EXAMPLE: The driver was upset about running out of gas on the freeway.

As these examples illustrate, each emotion specification has five major components. First is an emotion *type identification*, for example, Joy emotions. The type identification serves merely as a convenient label for the type of emotion being considered. This is followed by the *type specification*, which constitutes an approximate, if not complete, specification of the necessary conditions for the experience of emotions of that type. In the case of the Distress emotions, for example, the type specification is given as (DISPLEASED ABOUT) AN UNDESIRABLE EVENT. Notice that the type specification has two parts. The first, enclosed in parenthesis, specifies the kind of reaction (pleased/displeased, approving/disapproving, or liking/disliking). The second part, immediately following the parenthetical reaction type, which in this case is simply AN UNDESIRABLE EVENT, comprises the eliciting conditions for the emotion type. Thus, the type specification essentially identifies the location of the emotion within the overall structure proposed in Figure 2.1. The third component of an emotion specification consists of a partial list of *tokens*, that is, a list of words or phrases that constitute the family of emotions of that type and that share the same type specification as a necessary part. These tokens are presented as adjectives, adjectival forms, or nouns; occasionally as verbs. The fourth major component is a statement of the major local *variables affecting intensity*, which, for the examples above, is simply the *desirability* variable expressed in terms of desirability for the positive emotion and undesirability for the negative one. This does not mean that we shall not discuss the effects of the global variables, but only that we do not specify them in the emotion specifications. Finally, each emotion specification ends with a prototypical *example*.

We should mention immediately that we view each emotion specifica-

tion, or characterization, as a *proposal* rather than as an empirically established fact. Our view is that there is indeed a distinct emotional state that can be approximately described by each of our type specifications, but that the degree to which the English language (and any other language for that matter) provides a good lexical representation of each of these emotion types varies a great deal. This means that we would be perfectly willing to acknowledge that some of the particular tokens that we associate with an emotion type might be better or equally well associated with a different type. The goodness of fit of tokens to type specifications is an empirical issue. We have done the best we can in the absence of well-established data, although in some cases we do have preliminary data that convince us that many of our assignments are reasonable. Yet, ultimately, the important questions do not have to do with whether or not we have made optimal assignments of tokens to types, but whether or not the types we specify more or less exhaust the space of human emotions, and whether they have the intensity characteristics we assign to them. Similarly, we want to emphasize that the proposed intensity variables also still only have the status of proposals. Generally, we specify these variables in a manner that suggests (but only suggests) that the intensity of the emotion is monotonically related to the level of the variable (for example, that the intensity of Distress emotions is monotonically related to increases in undesirability). However, while in many cases we suspect the relation is indeed a positive monotonic one, this is by no means always the case. We consider the determination of the functions that relate the intensity variables to emotions to be an empirical question to be investigated in future research.

As already indicated, in order to simplify the exposition, we shall often use the terms "joy" and "distress" as convenient shorthands for the reactions of being PLEASED ABOUT A DESIRABLE EVENT and DISPLEASED ABOUT AN UNDESIRABLE EVENT, respectively. The type specifications for these emotions are trivially simple. They indicate only that in the absence of any other factors, when a person reacts to a desirable event, the eliciting conditions for a Joy emotion are satisfied, and that when a person reacts to an undesirable event, the eliciting conditions for a Distress emotion are satisfied. So, for example, a person who learns that he is to receive a small but completely unexpected inheritance as a result of the death of a distant but unknown relative would feel pleased. His reaction is one of being pleased simply because he is reacting to the desirable event of increasing his wealth. In this particular example, the unexpectedness is likely to intensify the emotion through its effects as a global intensity variable. When unexpectedness is low, such emotions are correspondingly less intense. In fact, as we shall see in the next chapter, when a desirable event is

actively expected, the dominant emotion is likely to be a Prospect-based emotion.

Our example of a Distress emotion is that of a person whose car runs out of gas on the freeway. To the extent that he thinks only about the undesirability of the event, the eliciting conditions for a Distress emotion (only) will be satisfied. His reaction will be one of being displeased simply because he is reacting to the undesirable event. The important point about Joy and Distress emotions is that they result from focusing only on the desirability or undesirability of the event. It is perfectly possible for a person to focus on other aspects of the event as well, for example that it was anticipated, or that some person was responsible for bringing it about. When this happens, more differentiated forms or different emotions arise.

The intensity of the Well-being emotions is influenced only by desirability and the global variables. In the last chapter we discussed a number of variables that always influence the intensity of emotions regardless of where these emotions lie in the overall structure. These variables include factors such as *unexpectedness* and *proximity*. Because these variables influence the intensity of all emotions, we have not specified their effects in the characterization of the Well-being emotions. In general, we do not mention these global variables in the specifications of individual emotions because to do so would be redundant and would tend to reduce the emphasis we want to place on the local variables that play a role in discriminating among emotions and emotion groups. The only exception to this rule is when a global variable manifests itself in an idiosyncratic manner for some particular group of emotions. As for desirability, clearly, if desirability is high, the intensity of the Joy emotion will be high and we might be willing to actually call the emotions "joy," "delight," or even "ecstasy." On the other hand, if desirability is low, the intensity of the Joy emotion will be low, and we might be more inclined to describe the experience as one of being "contented." If the desirability is below some threshold, there might be no emotional experience at all, even though the eliciting conditions might have been satisfied. Similarly, if the event being contemplated is highly undesirable, the intensity of the resulting Distress emotion would be high and we might prefer a term like "distraught."

One final point about the nature of the desirability variable needs to be emphasized here. *Desirability* and *undesirability* are always computed in a context. That is, there is always some (usually implicit) comparison event. In the case of the paradigm examples of joy and distress cited above (learning of an inheritance, and running out of gas) it is not easy to see this because the implicit comparison event is simply the absence of the event to which the emotion is a reaction. However, it is a simple matter to construct

a situation in which this would not be the case. Compare two people living in a country ruled by a totalitarian and oppressive regime. One of these people has never had any problem with the authorities and leads what for all intents and purposes is a normal life. The second person has been held for years in a prison, branded as a "dissident." Now suppose that the dissident is released and confined to his house under "house arrest," while the other, suddenly suspected of subversive activities, is similarly confined to his house under house arrest. After the initial reactions to their new situations have subsided, each is likely to evaluate the event relative to a different comparison event so that the dissident is likely to feel happy, evaluating his house arrest in comparison to his long imprisonment, while the other is likely to feel unhappy, evaluating his house arrest in comparison to his prior freedom.

Loss Emotions and Fine-grained Analyses

In all of the emotions groups that we shall consider, there are cases in which some of the associated lexical items (i.e., "tokens") appear not to fit very well. In the present case, *grief* might be such an example because it is clearly much underspecified by the type specification for distress. There is much more to grief than being displeased about an undesirable event. As we shall repeatedly emphasize, our type specifications are not intended as definitions of the emotions appearing in the lists of tokens. Our claim is only that the type specification constitutes a necessary condition for them. The degree to which additional specification would be required to characterize particular tokens varies from almost nothing to a great deal. Thus, we think that the type specification of being DISPLEASED ABOUT AN UNDESIRABLE EVENT is both necessary and sufficient for the emotion that is commonly called "distress," but that it is only part of the story for emotions such as grief. In order to deal with such underspecified cases it is going to be necessary to undertake a more fine-grained analysis. It is beyond the scope of this book to provide such an analysis for all the apparently poorly fitting terms. However, it is important that we illustrate what it is that we have in mind here, partly to show that it is indeed possible to account for such emotions, and partly as an illustration of the principles that we think underlie such an analysis. We shall therefore consider how we would propose to handle grief in the Well-being emotions.

Our claim is that grief is a Distress emotion. That is, grief is a reaction to an undesirable event. What distinguishes grief from the more general notion of distress is that in the case of grief we are reacting to a particular kind of

undesirable event, namely the irrevocable loss (i.e., death) of a loved one. In other words, what happens is that part of the type specification has been constrained to a particular value or range of values (in this case, the nature of the undesirable event is constrained to the loss of a loved one). This suggests a general strategy for undertaking more fine-grained analyses within the overall framework that we have outlined. When there appear to be several different emotions that represent the same general emotion type, except that they are differentiated from the main type by a restricted range of values on one or more of the features in the type specification, a new subtype can be created. Thus, one might propose a subtype of the Well-being emotions that could be called "Loss" emotions, for which the type specification would be DISPLEASED ABOUT THE UNDESIRABLE EVENT OF A LOSS. Such a subgroup might then accommodate tokens such as grief (irrevocable loss of a loved one), homesick (loss of the comforts of home), loneliness (loss of social contact), lovesick (loss of the object of romantic love), regret (loss of opportunity), etc. In fact, of course, this is precisely the principle that gives rise to the postulation of different groups in the main structure. So, for example, when the desirable or undesirable event has to do with prospects, we develop the Prospect-based group. The difference between those groups we have developed and those that we leave to further fine-grained analyses is that the ones we have developed are general, they are valence-independent, and, above all, they have systematic structural properties. The ones that we have not developed tend to be more specific and restricted to only one valence, that is, they apply only to one half of the superordinate emotions, as is the case with the Loss emotions, and they appear to have no systematic internal structure.

While the Loss emotions can be distilled out of the Distress emotions by restricting the range of a feature in the type specification (that is by specializing the undesirable event as a loss), more fine-grained analyses can also be undertaken by considering the effects of restricted ranges of values of intensity variables. This applies to both individual local or global variables or to their combined effects. For example, in the Distress emotions, when the value on the desirability or undesirability variable is at the high end, different words seem more appropriate to describe the resulting emotion (e.g., "euphoric," "miserable"). When the *unexpectedness* variable is in the high range, words like "shock" and "pleasant surprise" seem to better describe the emotion. The important point here is that all such terms refer to Joy or Distress emotions, but the richness of the language provides us with ways of indicating particular cases with particular characteristics in a distinct way.

Table 5.2. *Fortunes-of-others emotions*

REACTION OF SELF	PRESUMED VALUE FOR OTHER	
	DESIRABLE	UNDESIRABLE
PLEASED	pleased about an event desirable for someone else (e.g., happy-for)	pleased about an event undesirable for someone else (e.g., gloating)
DISPLEASED	displeased about an event desirable for someone else (e.g., resentment)	displeased about an event undesirable for someone else (e.g., sorry-for)

The Fortunes-of-others Emotions

We turn now to our analysis of a second group of emotions. Like all Event-based emotions, the Fortunes-of-others emotions depend on the implications of events for one's goals. In these emotions, however, the events in question always concern what happens to other people. One's affective reaction, therefore, depends in part on the presumed desirability of an event for another person and in part on the desirability from one's own perspective of the other person's experiencing that outcome. Determining the desirability for the other person requires that one have, or construct, at least a partial model of the other person's plans and goals. The desirability of the event from one's own perspective, on the other hand, is likely to be based on one of several specific factors. For example, when one is pleased for another person who experiences good fortune, the basis on which one assesses the event as desirable may simply be that one likes the other person and therefore wishes him well. Similarly, when one is pleased over the misfortune of another person, the basis may be that one dislikes the person. In other cases, a judgment of deservingness may motivate one's reaction. One might find it undesirable, for example, for someone to get an extravagant pay raise to the extent that one judges it to be undeserved. The Fortunes-of-others emotions are thus influenced both by the (presumed) desirability of the event for the other and by the desirability from one's own standpoint of the other experiencing such an outcome. The general structure of the Fortunes-of-others group is presented in Table 5.2.

Examination of the diagonals in the table reveals two subclasses of emotion types. The incongruent cells, that is those in which the desirability of the event for self is not congruent with the desirability of the event for the other, can be thought of as Ill-will emotions, whereas the congruent cells give what might be called Good-will or Empathetic emotions. When a

person judges an event to be undesirable for another person and is pleased about that fact, we sometimes describe the person as "gloating" (over the misfortunes of others). This is one of the Ill-will emotions. The other arises when one is displeased about some event that one judges to be desirable for the other person. Although the English word "resentment" is somewhat ambiguous, there is one sense in which it means just this. The congruent cases consist of events that are judged to be desirable for the other also being judged desirable for the self, and events that are judged to be undesirable for the other also being judged undesirable for the self. These Good-will emotions, for which being "happy-for" and "sorry-for" (i.e., pitying) someone else are reasonable terms, are basically just cases in which what is good for others is good for us, and what is bad for others is bad for us, although the sense in which these are good and bad for us may often be simply that we wish our friends to prosper and for others to get what they deserve.

We present first the specifications for the Good-will emotions:

(5.3) **HAPPY-FOR EMOTIONS**
TYPE SPECIFICATION: (pleased about) an event presumed to be desirable for someone else
TOKENS: delighted-for, happy-for, pleased-for, etc.
VARIABLES AFFECTING INTENSITY:
(1) the degree to which the desirable event for the other is desirable for oneself
(2) the degree to which the event is presumed to be desirable for the other person
(3) the degree to which the other person deserved the event
(4) the degree to which the other person is liked
EXAMPLE: Fred was happy for his friend Mary because she won a thousand dollars.

(5.4) **SORRY-FOR EMOTIONS**
TYPE SPECIFICATION: (displeased about) an event presumed to be undesirable for someone else
TOKENS: compassion, pity, sad-for, sorry-for, sympathy, etc.
VARIABLES AFFECTING INTENSITY:
(1) the degree to which the undesirable event for the other is undesirable for oneself
(2) the degree to which the event is presumed to be undesirable for the other person
(3) the degree to which the other person did not deserve the event
(4) the degree to which the other person is liked
EXAMPLE: Fred was sorry for his friend Mary because her husband was killed in a car crash.

These two, Good-will, emotions are the *empathetic* emotions in that they depend upon the person experiencing them empathizing with the other. In

our view, empathy requires a person to understand or appreciate how another person must feel, given the situation the other is in, and it requires the empathizing person to be in some related (but not necessarily identical) emotional state. Thus, empathy is not an emotion on our account, although there are empathetic emotions.

We propose four main variables as affecting the intensity of the Fortunes-of-others emotions. There is, however, no implication in the separate listing of these four intensity variables for these (or other) emotions that they necessarily always function independently of one another. The reason they are listed separately is that even though they can interact, and even though sometimes the effects of one variable are exerted through one of the other variables, it is *possible* for each variable that is listed to have an independent effect (see Chapter 4). The first variable we list as influencing the intensity of the Fortunes-of-others emotions is the same desirability variable that is involved in all of the Event-based emotions.[1] We refer to this as *desirability-for-self* to distinguish it from the second variable that also has to do with desirability, albeit with the desirability for the other person. The other two variables that we shall discuss are deservingness and liking. As with all Event-based emotions, the contribution of the desirability-for-self variable is determined with respect to the experiencer's own goals. This means that these emotions can only arise if the fortunes of the affected others are somehow relevant to one's own concerns. Beliefs about what is deserved and fair can clearly interact with this in the sense that what is desirable for a person with respect to others may be that the world "treat them fairly," that is, that they (and people in general) get what they deserve. In general, in the Fortunes-of-others emotions, the desirability of the event for oneself need not depend on active plans and goals to benefit or harm the other person. More often, it results from the impact that events are seen to have on one's interests (I-goals), particularly as they pertain to the well-being of others. Thus, one might be pleased for a liberal senator who is elected in another state without ever having striven for this outcome, or one might be pleased at reading newspaper stories in which virtue is rewarded, scoundrels are thwarted, and justice prevails. These involve the furtherance of one's interests and concerns in a general way and therefore represent the partial fulfillment of I-goals, but they probably do

[1] We should mention that in the type specifications of the Fortunes-of-others emotions, we mean it to be understood that when the reaction is one of being pleased, the event about which one is pleased (i.e., the event presumed to be desirable for someone else) is by implication (necessarily) a desirable event for oneself. Similarly, being displeased is assumed to entail that the object of one's displeasure is undesirable for the self, regardless of its presumed desirability for the other person.

not affect one's active plans or A-goals. Similarly, to take the example used in our characterization of the Happy-for emotions, if Fred feels happy for Mary because she won a thousand dollars, Mary's winning is not an event for which it would make sense to say that Fred would (or even could) have an A-goal, but it is an event that might further his general interest in the well-being and happiness of his friends, and perhaps of Mary in particular. On the other hand, one need not even know the victims of a disaster to feel pity for them, because one has a general interest (an I-goal) that people should not suffer undeservedly.

Clearly, because the Fortunes-of-others emotions involve reactions to events deemed to be desirable or undesirable for someone else, the degree to which these events are judged to be desirable for the other person is going to influence the intensity of the reaction. This is represented by the *desirability-for-other* variable. Of course, the question here is not how well or badly off the target person really is, but how the experiencer perceives the other to be affected by the event. He perceives the event as being desirable or undesirable for the other, presumably in terms of his beliefs about the goals and interests of the other person. To see this, consider again the example of Fred being happy for Mary because she has won a thousand dollars. Other things being equal (especially, Fred's degree of liking for Mary), if Mary were already very wealthy, coming from a rich family that constantly showered expensive gifts on her, Fred might perceive Mary's winnings as being less desirable for her than he would have done had she been poorly paid and not from a rich family. Thus, one feels happy-for someone when something happens that one thinks is desirable for them, and the more desirable one thinks it is (although, possibly only up to a point) the more intense is the Happy-for emotion. The same pattern of effects applies to the Sorry-for emotions, as can be seen by considering the example offered in our characterization of them: If Fred learns that the husband of his friend Mary was killed in a serious accident, Fred would ordinarily feel very sorry for Mary. But suppose Fred knew that Mary's husband habitually beat her, and that she no longer had any affection for him. In this case, we might expect him to feel less sorry for her because he would presume the event to be less undesirable for her. Indeed, it is conceivable that he would (rightly or wrongly) view such an event as being a desirable event for her, in which case he might even feel happy for her (appropriately or not, as the case may be). One would expect Fred to feel a great deal of pity and sympathy if he believed that Mary had loved her husband deeply. In other words, while holding other factors constant, the assessment of the undesirability of the event for Mary, and hence the degree to which Fred might feel sorry for her, is likely to be lower in the first case than it is in the second.

The third variable affecting the intensity of the Fortunes-of-others emotions (both for the Good-will emotions and the Ill-will emotions) is *deservingness*. This variable is clearly important in that we tend to be more pleased at the good fortunes of others to the degree that we think them deserved, and we tend to have more sympathy for them in times of misfortune to the degree that we believe the ill fate is not deserved. In particular, people are inclined to have much less sympathy for others, even friends, whom they believe to have brought their ill fate upon themselves. Such beliefs are not necessarily sufficient to nullify the emotion, but they certainly temper it. Thus if a person, contrary to all the wise council of experts and friends, makes a foolish investment and loses his life savings, we are inclined to be less sympathetic than if he had been defrauded of the same amount of money.

Our account of the intensity of the Good-will emotions suggests that the more pleased one is (desirability-for-self) about a good thing that happened to another person (desirability-for-other), and the more one thinks the person deserved what he got, the more happy for the other one feels. However, as mentioned above, this does not mean that the two forms of desirability and deservingness always act independently – they can, but they need not. If the desirability of the event for the other is judged to be beyond what is deserved, one will not necessarily feel happy for the other at all, but may come to resent the other instead. For example, suppose that two players on a college basketball team recognize one another as being similarly talented and that, as friends, they wish one another well. Now suppose that one of them is drafted by a professional team and signs a million-dollar contract while the other is not drafted at all, shattering his dreams of fame and fortune. This second, unfortunate, basketball player is as likely to resent the good fortunes of his teammate as he is to feel happy for him, notwithstanding his congratulations. One reason for this is that the experiencer determines deservingness partly by reference to his or her own situation. The basketball player who is not drafted might well think that his teammate deserves to be drafted along with him, while believing that his teammate does not deserve to be drafted if he is not drafted himself. In this sense, the Fortunes-of-others emotions can be thought of as emotions based on social comparison (Suls & Miller, 1977). We shall have more to say about the social comparison aspect when we discuss the Ill-will emotions, especially resentment.

The fourth main variable affecting this group of emotions is that of *liking*. The way in which the liking variable functions in these emotions is more complicated than might appear at first sight. One reason for this is

that it is possible for the empathetic emotions to be experienced even with negative values of the liking variable. During the Watergate scandal in the early 1970s many people grew to dislike Richard Nixon. Nevertheless, this dislike did not exclude the possibility that some of those people felt sorry for him as they reflected on his demise. This is why we treat liking as an intensity variable rather than as part of the eliciting condition itself. Doing so allows for the possibility that one can feel sorry for somebody one does not actively like. If liking were part of the type specification it would mean that one could not feel happy or sorry for someone unless one liked that person. In fact, it seems to us that high values of the desirability and deservingness variables can outweigh reasonably small negative values of the liking variable. At the same time, we acknowledge that paradigm examples of feeling happy and sad for others do not involve cases where the person is actively disliked. It should also be noted that expressions of sympathy for disliked others in very undesirable situations might be no more than that – mere expressions. They do not necessarily reflect *emotion* at all, although they may reflect a cognitive state in which one recognizes that some (but not all) of the requirements for an emotion have been satisfied.

Apart from the complication pertaining to the lower bound of the liking variable in the Good-will emotions, it is fairly clear that, within limits, the more one likes the other, the more intense will be the emotions. We should reiterate here that in postulating liking as affecting the intensity of Fortunes-of-others emotions, we have in mind the influence of *momentary* liking, not dispositional liking. Of course, one's momentary assessment of liking is usually consistent with, and largely determined by, one's dispositional liking for that person, but an assessment of liking or disliking may be subordinated in any given moment to other concerns, so that one may neither actively like nor dislike a dispositionally liked or disliked person in that moment. Thus, although a person who dispositionally disliked Nixon would not pity him while focusing on the dislike, he might do so while focusing on other aspects of the ex-president's situation, because he would not then be in a momentary state of dislike. By using momentary as opposed to dispositional liking as our intensity variable, we do not wish to deny that dispositional liking can have important influences on the Fortunes-of-others emotions. One of these influences, as we have just seen, is through the control that dispositional liking exerts over momentary liking. Another influence is through the desirability-for-self variable. Clearly, the more one likes a person, the more important are the fortunes of that person going to be with respect to one's own goals.

The Fortunes-of-others emotions are uniquely social emotions, to which

the unexpectedness of the event) will result in more intense emotion, and second, failure to cope due to inability (even given enough time) will result in more intense emotion. Care has to be taken here, however, in separating out the *intensifying* effects of failure to cope and the emotion-inducing effects. Failure to cope, especially of the second, inability, type is likely not only to intensify emotions, but also to generate emotions. Despair may be born of fear when resignation sets in because the person comes to believe that he has no control over the situation.

When a person is in an emotional state, his being in that state is as much a situation as any other. Consequently, as discussed in the last sections of Chapter 2 and of Chapter 8, a person in an emotional state may experience additional emotions as a result of it. This means that the question of coping can arise as much for emotions themselves as it can for the situations that give rise to them. A person may be unable to cope with his joy, or his anger, or his fear. Interestingly, the English language has a number of expressions that imply an inability to cope with emotions themselves. We speak of people as "crying with joy," "out of control," "beside themselves," and so on. Here we have an interesting phenomenon. One would think that if an inability to cope with a situation intensifies the resulting emotion, then in cases where the emotion is positive, as in hearing the news about the million-dollar win, the joy would be more intense. We have argued that in some cases the failure to cope is due to the unexpectedness, and in such cases it seems reasonable to take the position that the intensity of the resulting (positive) emotion might be increased – unexpected pleasures are more pleasing than expected ones. But, perhaps the other kind of failure to cope does not enhance the intensity of positive emotions. There is something counterintuitive about proposing that inability to cope enhances positive emotions. One would think that people would find such failure aversive, regardless of its cause. In extremely positive situations in which there is an inability to cope, it might be that two things are going on: a high level of arousal that amplifies the intensity of all active emotions *and* some elements of negative emotion as a result of the coping failure. When people cannot cope with positive emotions they often behave in a manner that has many similarities with the behavior associated with the experience of negative emotions (we have already noted how they can "cry" with joy). It would make good sense to discover that the mechanisms associated with distress and other negative emotions are activated because of the negative construal of the inability to cope, even while the positive emotions are the ones that are predominantly experienced. Interestingly, such highly arousing situations *are* often accompanied by cognitive states which themselves can occasion negative reactions, states such as a sense of confusion and

disorientation. Such symptoms are particularly noticeable in cases of intense relief. The profusion of tears shed by the near and dear on the return of their loved ones who had been held hostage in Iran or Lebanon is testament to this fact.

In the case of positive emotions, the inability to cope seems to pose something of a paradox – a paradox that we hope our discussion has at least partly resolved. The result is an intensification of the entire *emotional experience* even though some of this is realized through the combined effects of the positive emotions and the negative consequences of the inability to cope with them. In the case of negative emotions, failure to cope with the emotions themselves is easier to understand. The grief is made worse because the person doesn't know what he is going to do and how to handle the new situation.

In our discussion of the Prospect-based emotions we noted the role of proximity – the closer some feared event seems to be, the more intense the fear. Proximity may be influential not only because increases in proximity render the anticipated event psychologically more real, but also because the reduced intervening time between the experience and the anticipated situation entails less time for the psychological preparation that is required by the situation. Coping, therefore, is an important aspect of emotional experience. It is, of course, closely related to the degree of control a person perceives himself as having – the more control a person has, the more will he be able to cope. Yet the two are not identical. A person may have no control over the expected death of a loved one, yet believe that he or she can deal with the situation when it arises.

The main point of the observations we have made here is to suggest that there may be a cycle in which emotion-inducing situations lead not only to emotions themselves, but also to a need to cope with the emotions to which they give rise. The extent to which a person does cope, or thinks he can cope, in turn influences not only the intensity of the emotions that arise, but in some cases creates new, additional emotions, along with new demands on the coping mechanisms.

Computational Tractability

At the beginning of this book we mentioned that one of our goals was to lay the foundation for a computationally tractable model of emotion. It is therefore fitting, perhaps, that we conclude by reviewing the proposals we have made in light of this goal. We shall do this by presenting some examples of the kind of formalisms that might be derived from our emotion characterizations and discussing how they might contribute to some of the

goals of Artificial Intelligence (AI), and how the methods of AI might help us to evaluate, modify, and improve the account of the emotions that we have offered.

Before we proceed with our discussion, we should clarify what we take to be the issue here and, in particular, what we take not to be the issue. Our interest in emotion in the context of AI is not an interest in questions such as "Can computers feel?" or " Can computers have emotions?" There are those who think that such questions can be answered in the affirmative (e.g., Frijda & Swagerman, 1987; Sloman & Croucher, 1981), however, our view is that the *subjective experience* of emotion is central, and we do not consider it possible for computers to experience anything until and unless they are conscious. Our suspicion is that machines are simply not the kinds of things that can be conscious. However, our skepticism over the possibility of machines having emotions certainly does not mean that we think the topic of emotion is irrelevant for AI; on the contrary, we think it is an important and much neglected topic in the field. There are many AI endeavors in which the ability to understand and reason about emotions or aspects of emotions could be important. Obvious examples include natural language understanding, cooperative problem solving, and planning.

If computers are going to be able to reason about emotions, the first thing that will be needed is a system of rules and representations about the elicitation of emotions. We think that the emotion characterizations that we have proposed can provide the basis for a first step in this direction. The simplest of these rules will be those for the Well-being emotions. One might associate two main rules with each emotion. For example, for Joy emotions, one of these two rules might be something like Rule (1) below:

(1)   IF DESIRE $(p, e, t) > 0$
        THEN *set* JOY-POTENTIAL $(p, e, t) =$
            $f_j [\,|$ DESIRE $(p, e, t)\,|, I_g (p, e, t)]$
        Where $|$ DESIRE $(p, e, t)\,|$ is the absolute value of a function that returns the degree of desirability that a person, p, assigns to some perceived event, e, at time, t, under normal conditions, and where $I_g (p, e, t)$ is a function that returns the value of the combined effects of the global intensity variables.

The left-hand side of this rule is basically just a statement of the eliciting conditions for Joy emotions (see Chapter 5); it merely specifies the condition that some event be desirable. Specifically, the rule asserts that if the desirability of some event, e, in working memory is positive, then the value of a function called JOY-POTENTIAL should be set to the value returned by a function, $f_j [\,|$ DESIRE $(p, e, t)\,|, I_g (p, e, t)\,]$, that represents the

combined effects of the variables postulated as influencing the intensity of Joy emotions. The first argument of the function, f_j, which is a function that is specific to Joy emotions (hence the subscript, j), is the absolute value of the desirability of the event, e, for the experiencing person, p, at time t. The second argument, $I_g (p, e, t)$, represents the contribution to intensity made by the global variables in response to the event.[1] Note that the DESIRE function is a function that computes desirability in the technical sense in which we have used it throughout this volume; it does not refer to the degree to which the person wants the event but to the accumulated beneficial consequences of the event when it returns a positive value, and to the accumulated harmful consequences of the event when it returns a negative value.

The rule for Distress emotions would be the same as Rule (1) except that the value of the DISTRESS-POTENTIAL function is only set if the DESIRE function returns a negative value. JOY-POTENTIAL and DISTRESS-POTENTIAL are definitely *not* the same thing as the emotions of joy and distress. Such *emotion-potentials* serve two purposes. First, they can serve a sort of empathetic role by allowing the inference that joy and distress are possible emotions under the current conditions – an intelligent conversation program might use the activation of joy-potential as the basis for a question like "Was what happened sufficiently important to make you feel happy?" Second, they invoke other rules (e.g., Rule 2, below) that check whether the intensity of the reaction is sufficient to activate the emotion, and, if so, set the intensity of the emotion in question.

A crucial component of the account of emotion that we have presented in the preceding chapters is that in order for an emotion to be experienced, the intensity of the reaction has to be above some threshold value. The main purpose of the emotion-potential functions is to allow for the computation of the magnitude of the reaction without prejudice as to whether or not an emotion ensues. Up to this point, we have only shown how it might be possible to formalize the elicitation of an emotion-potential. In order to determine whether any emotion in fact ensues, and if so, with what intensity, we shall need rules such as Rule (2):

(2)   IF JOY-POTENTIAL $(p, e, t) >$ JOY-THRESHOLD (p, t)
        THEN *set* JOY-INTENSITY $(p, e, t) =$
            JOY-POTENTIAL $(p, e, t) -$ JOY-THRESHOLD (p, t)
        ELSE *set* JOY-INTENSITY $(p, e, t) = 0$

---

[1] We shall not elaborate here on how the global variables (e.g., sense of reality, proximity, and unexpectedness) might be represented because such an excursion would take us too far afield.

Rule (2) checks to see whether the current value of JOY-POTENTIAL exceeds the threshold (i.e., JOY-THRESHOLD) required to establish a Joy emotion. In this way, if a Joy emotion is a possibility, and the variables hypothesized to affect the intensity of Joy emotions give rise to a value that exceeds the current threshold (i.e., the threshold for person p at time t), it activates the Joy emotion, by setting JOY-INTENSITY, for p, with respect to event, e, starting at time, t to the discrepancy from the threshold. Otherwise, the value of JOY-INTENSITY is reset to zero, indicating that p definitely does not experience joy in response to event e at time t. The need for this last step will become clear later. However, we should point out right here that although we are not proposing to directly compound the effects of different events that give rise to JOY-POTENTIAL into JOY-INTENSITY, setting the intensity to zero does not result in all trace of the potentially emotion-inducing event being lost because the current value of JOY-POTENTIAL is preserved. We are assuming that when the value of JOY-INTENSITY exceeds its default value of zero, it is tantamount to asserting the truth of a predicate, JOY, which means that the system is postulating the existence of a feeling of joy in p about event, e, initiated at time t. The structure of the rule for Distress emotions would be identical to Rule (2) except that it would employ a distress-specific function, f_d, instead of the joy-specific function, f_j.

In an AI context, there are important beneficial side-effects that result from distinguishing between emotions and emotion-potentials. The distinction would make it relatively easy for a natural language-understanding system to deal with certain mood effects, as would be required, for example, to make sense of sentences like "John was in a wonderful mood that morning. When his children were obnoxious at breakfast, it didn't bother him at all." One might suppose that obnoxious children at breakfast would bother John if he were not in a good mood, and certainly that they would if he were in a bad mood. This knowledge can be fairly easily represented under the present proposal. The effect of the first sentence would be to *raise* the threshold value for many of the negative emotions, and lower it for positive ones. The result would be that, for example, anger could now only be activated with a higher value of the function that combines its intensity factors, and even then, the resulting anger would be less intense than would be the case if the threshold were at its default value. This is because the intensity of an emotion is determined by the difference between the magnitude of the effects of its intensity variables and its current threshold value, as illustrated in Rule (2).

The distinction between emotions and emotion-potentials also provides a mechanism for solving some other traditionally difficult problems in natu-

ral language understanding. In particular, it makes it relatively easy to solve the pragmatic inference problems surrounding denials. Suppose a text starts with the sentence "John was not afraid as he entered the court room." Human language understanders spontaneously make the pragmatic inference that the situation was one in which one might have expected John to be afraid. In the system we propose, this can be handled by allowing FEAR-POTENTIAL to be activated while setting its value below that of FEAR-THRESHOLD. In other words, what the system would do is exactly what the pragmatic inference licenses, namely it would recognize that a potentially fear-inducing situation existed which, in fact, did not give rise to fear.

It would be a relatively simple matter to augment rules such as Rule (2) to select one or more appropriate English language tokens that roughly reflect the current intensity. Thus, for example, if the value of JOY-INTENSITY is relatively low, it might select tokens such as "pleased" and "glad." If very high, it might select "ecstatic" or "euphoric." The effects of these tokens could, of course, be modified through the use of qualifying adjectives, however, that is a detail we shall not discuss here. A reasonable mapping between lexical items and intensity ranges for different emotion types could easily be achieved through the use of an empirically derived intensity map.

Having dealt with a very simple case, we can now outline the sort of rules we anticipate for a Prospect-based emotion such as fear.

(3)   IF PROSPECT (p, e, t) AND DESIRE $(p, e, t) < 0$
       THEN *set* FEAR-POTENTIAL $(p, e, t) =$
            $f_f [\mid$ DESIRE $(p, e, t) \mid$, LIKELIHOOD (p, e, t), $I_g (p, e, t)]$

(4)   IF FEAR-POTENTIAL $(p, e, t) >$ FEAR-THRESHOLD (p, t)
       THEN *set* FEAR-INTENSITY $(p, e, t) =$
            FEAR-POTENTIAL $(p, e, t) -$ FEAR-THRESHOLD (p, t)
       ELSE *set* FEAR-INTENSITY $(p, e, t) = 0$

Rule (3) indicates that when it is true that p entertains the prospect of e at time t (indicated by the predicate, PROSPECT), and if p considers e to be undesirable at time t, then the potential for fear will be triggered. In other words, it specifies the eliciting conditions for Fear emotions (see Chapter 6). As with Rule (2), the magnitude of the emotion-potential is determined by the intensity variables hypothesized to influence the intensity emotion — in the case of fear, by the absolute value of the desirability of the event, the subjective likelihood that it will be realized, and the contribution of global factors. Rule (4) then determines whether the magnitude of FEAR-POTENTIAL exceeds the current threshold for Fear emotions, and if so it

sets the intensity of fear to the difference between the current value of
FEAR-THRESHOLD and the just set value of FEAR-POTENTIAL. Other-
wise, it resets the value of FEAR-INTENSITY to zero to represent the fact
that p did not experience fear in response to event, e, at time, t.

With these rules for fear in hand, we can now consider the the more
complex rules for relief :

(5)   IF FEAR-POTENTIAL $(p, e, t) > 0$ AND DISBELIEVE (p, e, t_2)
      AND $t_2 \geq t$
      THEN *set* RELIEF-POTENTIAL (p, e, t_2) =
         f_r [FEAR-POTENTIAL (p, e, t), EFFORT (p, e),
         REALIZATION (e, t_2), I_g (p, e, t_2)]

(6)   IF RELIEF-POTENTIAL (p, e, t_2) > RELIEF-THRESHOLD (p, t_2)
      THEN *set* RELIEF-INTENSITY (p, e, t_2) =
         RELIEF-POTENTIAL (p, e, t_2) − RELIEF-THRESHOLD (p, t_2)
      AND *reset* FEAR-POTENTIAL (p, e, t_2) =
         f_f [| DESIRE (p, e, t_2) |, LIKELIHOOD (p, e, t_2), I_g (p, e, t_2)]
      ELSE *set* RELIEF-INTENSITY (p, e, t_2) = 0

Several features of these rules warrant discussion. First, however, notice
that the left-hand side of Rule (5) is rather different from those that we
have discussed so far. It involves three conjoined conditions. One is that
FEAR-POTENTIAL (p, e, t) be greater than zero. The reason that RELIEF-
POTENTIAL depends upon FEAR-POTENTIAL rather than upon the emo-
tion itself (FEAR-INTENSITY) is that a suspicion that something unde-
sirable might be going to happen could give rise to FEAR-POTENTIAL
without sufficient intensity to exceed the FEAR-THRESHOLD, yet the sub-
sequent disconfirmation might still lead to relief. In other words, if the
potential for fear exists, then, necessarily, the potential for relief exists.
The second conjunct in the left-hand side of Rule (5) is the predicate
DISBELIEVE (p, e, t_2). The DISBELIEVE predicate has to be treated lo-
cally to the knowledge representation. That is, it is true just in case p
believes that e is no longer a possibility. Should it subsequently turn out
that p was wrong, and that e does or did indeed transpire, the associated
emotion of relief, if it was activated as a result of Rule (6), will have been
activated nonetheless, even if, in some objective sense, it was inappropri-
ate. Finally, the third conjunct involves the introduction of a second time
parameter, t_2. The constraint on this parameter is that t_2 not be before t as
indicated by the clause $(t_2 \geq t)$ in the rule. Usually, but not necessarily, t
precedes t_2 so that RELIEF-POTENTIAL at time, t_2, can only arise if there
was some FEAR-POTENTIAL at time, t.

The right-hand side of Rule (5) is also relatively complicated, although
the principle it embodies is the same as for comparable rules we have

already discussed, namely, it sets the value of the emotion-potential to
equal the value of a relief-specific function, f_r, whose value is determined
by the variables hypothesized to affect the intensity of relief. In the particu-
lar case of relief however, these variables are complicated by the fact that
they involve the embedded contribution of fear variables, represented by
FEAR-POTENTIAL (p, e, t). The other variables are the *effort* expended
with respect to the event (i.e., in attempting to prevent it), the degree to
which the event was *realized*, and the global intensity variables. A fully
worked out account of the contribution of effort to the intensity of relief
would probably have to exploit the distinction between instrumental and
non-instrumental effort discussed in Chapter 4. However, a detailed analy-
sis of how this distinction might be incorporated into the kinds of rules we
are sketching is beyond the scope of the present discussion. The other new
parameter introduced in Rule (5) – realization – is intended to reflect the
fact that some relief-inducing events may be feared events that were to
some degree (i.e., partially) realized (see Chapter 4).

The first part of the right-hand side of Rule (6) is essentially the same as
for the other emotions in that it sets the intensity of the emotion to the
difference between the level of the emotion-potential and the emotion
threshold. However, there is a clause in this rule that has no counterpart in
any of the other rules we have proposed, namely that which resets the value
of FEAR-POTENTIAL. The new value that gets assigned is the same as gets
assigned by Rule (3), but the value that gets returned will now depend
upon the current values (i.e., at time t_2) of the intensity factors (i.e., upon
DESIRE (p, e, t_2), LIKELIHOOD (p, e, t_2), and I_g (p, e, t_2)). This is probably
something of an oversimplification. However, it is a reasonable first ap-
proximation. Finally, the rule stipulates that if the threshold for a Relief
emotion is not exceeded, then the intensity of relief is set to zero. Notice
that, for technical reasons, the parameter, e, for RELIEF is the same as for
FEAR even though, at an intuitive level, people fear some particular event
but are relieved, not about the event, but about the *absence* of the event.
However, as long as we interpret RELIEF as being PLEASED ABOUT THE
DISCONFIRMATION OF THE PROSPECT (OF E) (see Chapter 6), this is
perfectly consistent.

These rules are beginning to become rather complicated, so we shall
briefly discuss an example to illustrate how they work. Suppose that p is
walking alone along a dark street in an unsavory part of town and he hears
quickening footsteps behind him. It occurs to him that perhaps he is going
to be mugged (i.e., he entertains the prospect of an undesirable event at
time t). By Rule (3), a value for FEAR-POTENTIAL will now be computed.
Let us suppose now that p has a high fear-threshold so that when Rule (4)

fires FEAR-INTENSITY gets set to zero. Now, let us add a little excitement: a police car comes screeching to a halt alongside the man behind p, and after a scuffle and a few gun-shots, the man lies dead on the sidewalk. With p's curiosity piqued, he inquires as to what happened and learns that the man was a dangerous, armed, escaped murderer, looking for money, food, and shelter. The police tell p that he would certainly have been brutally attacked had they not arrived when they did. This new situation, at time t_2, is sufficient to cause Rule (5) to fire because we still have FEAR-POTENTIAL for p from time t with respect to a mugging event, but now, at time t_2, p knows that the event cannot happen (i.e., the DISBELIEVE predicate is TRUE). The result of Rule (5) firing is that RELIEF-POTENTIAL now gets computed on the basis of the values of the intensity variables that led to p's prior FEAR-POTENTIAL, and the values of the other variables affecting the intensity of relief (effort, realization, and current values of the global variables). If this value exceeds RELIEF-THRESHOLD, then p will experience a Relief emotion. We can now see the point of the second action that results from Rule (6), the resetting of FEAR-POTENTIAL. The new value will be given by the values of the variables at time t_2, and we assume that this value is now lower than it was before, at least in part because of the reduction of the contribution of the likelihood variable to zero. Notice that if FEAR-POTENTIAL remains above zero, Rule (4) can fire again. Interestingly, if one were to allow the threshold for fear to lower as a result of what happened, it would now be possible for p to experience retrospective fear, even though he was not scared initially.

As a final example of the kinds of rules that might be developed, we shall consider how we might approach the Attribution emotions by looking at the rules for an Appreciation emotion such as admiration. The emotions, of course, will involve rather different intensity variables because they are based on the praiseworthiness of an action evaluated in terms of standards, rather than on the desirability of events evaluated in terms of goals.

(7)   IF PRAISE $(p, a, d, t) > 0$ AND NOT $(a = p)$
        THEN *set* ADMIRATION-POTENTIAL $(p, a, d, t) =$
            $f_a [| $ PRAISE $(p, a, d, t) | ,$
            DIFF $(a, a\text{-}type, d, d\text{-}type)$, $I_g (p, a, d, t)]$
        Where PRAISE (p, a, d, t) is a function that returns the degree of
        praiseworthiness that a person p, assigns to some agent's a, deed d, at
        time t, under normal conditions.

(8)   IF ADMIRATION-POTENTIAL $(p, a, d, t) >$
            ADMIRATION-THRESHOLD (p, t)
        THEN *set* ADMIRATION-INTENSITY $(p, a, d, t) =$
            ADMIRATION-POTENTIAL (p, a, d, t)
            $-$ ADMIRATION-THRESHOLD (p, t)
        ELSE *set* ADMIRATION-POTENTIAL $(p, a, d, t) = 0$

Again, the first of these rules, Rule (7), essentially represents the eliciting conditions for Appreciation emotions (see Chapter 7). Thus, the function PRAISE (p, a, d, t) represents the degree of praiseworthiness assigned to some agent's action. Rule (8) resets the intensity level relative to the current threshold, with its value ultimately depending on some (admiration-specific) function, f_a, of the two variables identified in the emotion characterization as being the local variables together with the effects of the global factors. The two local variables are PRAISE (p, a, d, t), and DIFF $(a, a\text{-}type, d, d\text{-}type)$. This latter function is intended to represent the "deviation of the person's action from person/role-based expectations," given the current context, including beliefs about the agent's role, etc. The four arguments it takes are the action or deed, d, of the agent, a, and the *type* of deed, $d\text{-}type$, one might expect of that *type* of agent, $a\text{-}type$. As we have discussed elsewhere, something like this is necessary in order to capture the intuition that one is likely to admire different people to different degrees for performing the same act because of who or what they are.

Our purpose in laying out the kinds of rules we have just reviewed is to show that our emotion characterizations do, in principle, have sufficient specificity to be developed into a formal system. We think that our discussion in Chapter 3 provides the necessary framework for computing functions such as DESIRE and, more speculatively, PRAISE. Notions such as THRESHOLD are easy to represent and, if allowed to change as a function of context, provide considerable power and flexibility. We certainly do not want to suggest that it is a trivial matter to implement a formalism of the kind that we have outlined – all manner of issues remain to be spelled out in detail before this would be possible. For example, it will be necessary to determine the nature of the kinds of emotion-specific functions featured in Rules (1), (3), (5), and (7) and to experiment with the weights to be assigned to the intensity variables (see Chapter 4) for different emotions. Another important question we have completely ignored concerns the time course of the functions that will be used. Clearly it will be necessary to associate some sort of decay function with emotions and emotion-potentials, but we are nowhere near knowing what these functions might look like and whether there need to be many or just one.

The rules we have proposed appear to offer a mechanism that could deal with the creation of moods resulting from a number of individual events none of which produced sufficient intensity to give rise to an emotion. The simplest example to present is for joy: All that one would need to do would be to allow JOY-THRESHOLD to start to fall as the sum of the values returned by the JOY-POTENTIAL function started to rise. In this way, if

the person, *p*, were to experience a series of events that were potentially joy-inducing the probability of later ones resulting in a Joy emotion would increase, essentially as a result of a simulated mood effect in which several minor desirable events lead to a "good" mood, thus making it easier to experience a Joy emotion. Finally, the issue of conflict resolution will have to be dealt with – some sort of precedence rules will be required to determine under what conditions multiple rules can fire, and under what conditions choices have to be made – and what choices they would be – when the left-hand sides for several rules are satisfied.

Exactly what control mechanisms would be required to develop a working system along the lines we have suggested remains as a research problem. However, we think that we have shown that the potential is there, and we see many advantages in exploring the issue further. Apart from the relevance of emotions to a number of subareas in AI, we think that the AI enterprise itself can be beneficially exploited by emotion theorists. The possibility of implementing a formal model of the cognitive bases of emotions in a computer system raises the prospect of being able to experiment with some of the parameters of the model in ways which are impossible in the real world or in the psychological laboratory.

Summary

In this book we have not attempted to review either the theoretical or empirical literature on emotion. Nor have we focused on any of the research designed to test the proposals we have discussed. Instead, we have proceeded on the assumption that progress in psychological research on emotion can be attained through an analysis of the cognitions that underlie emotions. To this end, we raised and proposed provisional answers to two primary questions – "What is the cognitive structure of the emotional system as a whole?" and "What is the cognitive structure of individual emotions?" In the process of treating these questions, we have had to address many other subsidiary questions as well, although in many cases our answers were more implicit than explicit. One of the inescapable questions in such an enterprise is, of course, "What are emotions?" Our answer to this question emerged from pretheoretical research done earlier on the structure of the affective lexicon. That research is detailed elsewhere (Clore, Ortony, & Foss, 1987; Ortony, Clore, and Foss, 1987), and was not discussed here. In those reports it was proposed that emotions are internal, mental states that vary in intensity and that are focused predominantly on affect. By "affect" we simply mean evaluative reactions to situations as good or bad. However, the point of this definition was primarily to distinguish emotions from other kinds of affective conditions.

In this book we went beyond such a loose relatively theory-independent characterization of what an emotion is, proposing instead that emotions are *valenced reactions to events, agents, or objects, with their particular nature being determined by the way in which the eliciting situation is construed.* Saying that emotions are valenced reactions required us to examine the nature of the reactions and the source of the valence. This raised the question of how people arrive at evaluations, and of what it is about situations and about the people doing the evaluating that determines how they are evaluated. We presented only an outline of an answer to the first of these questions in our treatment of knowledge representation and the cognitive psychology of appraisal (Chapter 3). There, we sketched some of the structural considerations relevant to the question of how such appraisals might be computed. We believe that the development of a more detailed answer to that question represents the most significant challenge for cognitive scientists in the study of emotion. Most of this book was devoted to answering the second of the subquestions – namely, what it is about persons and situations that determines how situations are evaluated. The qualitative nature of the affective reaction depends in the first instance on what aspect of a situation is evaluated: an event, its agent, or an object. Depending on which of these is the focus of attention, the primary affective reactions include being pleased or displeased, approving or disapproving, and liking or disliking. In particular, the reaction of being pleased or displeased reflects one's perception of the consequences of events as desirable or undesirable. Desirability is computed on the basis of the implications an event appears to have for one's goals. The reaction of approving or disapproving reflects one's perception of an agent's action as praiseworthy or blameworthy. Praiseworthiness is computed on the basis of the standards, principles, or values implicated by the action. Finally, the affective reaction of liking or disliking reflects one's perception of objects (including persons, things, ideas, experiences, etc.) as appealing or unappealing with respect to one's attitudes towards them.

This general conception constituted the basis of our answer to one of the overarching questions with which we began. The structure of the overall emotional system can be represented as groups or families of emotion types that share the same eliciting conditions. These types are differentiated forms of more general affective reactions to events, agents, and objects. To the second overarching question, concerning the cognitive structure of individual emotions, there were as many answers as there are emotion types to be analyzed. The answers were presented in Chapters 5 through 8,