

THE COGNITIVE STRUCTURE OF EMOTIONS

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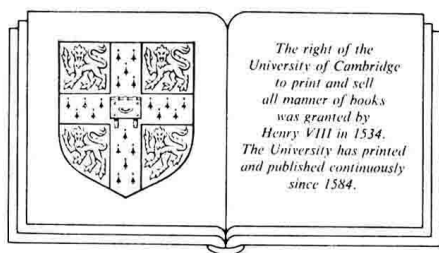
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To our wives,
Gillian, Judy, and Anne

Preface

As cognitive psychology established itself in the 1970s, it became increasingly apparent that it was a “cold” approach to cognition, and doubts began to arise as to whether or not it could provide the machinery necessary to account for affect and emotion. In 1981, Donald Norman identified the topic of emotion as one of twelve major challenges to cognitive science (Norman, 1981). It was at about this time that the three authors of this volume decided to collaborate in an attempt to explore the extent to which cognitive psychology could provide a viable foundation for the analysis of emotions. Certainly, it was no problem for cognitive psychology, with the help of schema theory, to explain such facts as that the same thing can be perceived from different perspectives. This was already encouraging, because the capacity to view a situation from different perspectives struck us as lying at the heart of the fact that different people often experience different emotions in response to the same objective event.

Many emotion theorists have argued that cognitive appraisal is central to emotion, yet no one has been able to say anything much more detailed than that. This book is an attempt to give at least the outlines of an account of how such appraisals are made. In it we present many detailed observations about specific emotions, their organization, and the specific cognitive processes involved in their elicitation, but we would be satisfied if this effort succeeded in demonstrating only that a systematic and comprehensive account of the cognitive antecedents of the emotions is possible. Our goal is to convince our readers that such an approach is viable rather than that our particular version of such an effort is the correct one. We have, in fact, chosen a somewhat arbitrary stopping point for this enterprise. Further use of the same structural principles that we propose would allow one to continue to specify increasingly differentiated sets of emotional states. The more one does this, however, the more one becomes tied to the emotional system associated with a particular cultural view of the world. This, in turn, increases the risk that one will lose sight of the main agenda, which is to

characterize the range of “psycho-logical” possibilities for emotions rather than to describe the emotions and emotion-related processes local to any specific time or cultural group.

We started collaborating on this project in the spring of 1980 when we began talking to each other about various emotions and the conditions of their occurrence. In the context of our common fascination with this problem, the differences in our backgrounds and interests made the end product different than it otherwise would have been. As a group we include a cognitive scientist interested in psychological, linguistic, and computational aspects of the study of mental processes, a social psychologist with interests in personality and in the influences of affect on social judgment, and a cognitive psychologist with interests in the formal modeling of human reasoning processes. As we started working out some of the ideas into a more concrete form it became clear that we were going to end up with a book—a book that we began to think of affectionately as *Principia Pathematica*. We saw ourselves as attempting to characterize some of the key principles governing the cognitive mechanisms underlying human emotions, so that title seemed to us apt and even a little humorous. After all, we tried to persuade ourselves, the Oxford English Dictionary contains the following (abbreviated) entry:

PATHEMATIC, *a. rare* [ad. Gr. *pathematicos* liable to passions or emotions, *f. pathema* what one suffers, suffering emotion, *f. stem path-*: see **PATHETIC**] Pertaining to the passions or emotions; caused or characterized by emotion.

However, many of our friends and colleagues were skeptical. The title we proposed would be incomprehensible to those lacking a classical education, they argued, and the book might well end up in the medical section of bookstores! Then again, there was the problem of hubris—was it not a little pretentious? We were eventually persuaded that discretion is the better part of valor, and settled on a title that, while maybe lacking something in panache, at least has the virtue of truth in advertising.

Thanks are due to a number of people and institutions for intellectual, financial, and moral support. In particular, we are grateful for the encouragement and helpful comments and observations of Bob Abelson, Gordon Bower, Jerry DeJong, Nico Frijda, Philip Johnson-Laird, George Mandler, George Miller, Robert Wilensky, and many colleagues at the University of Illinois at Urbana-Champaign, especially in Psychology. The ideas, criticism, enthusiasm, and hard work of the members of our research group, including Mark Foss, Terry Turner, Jerry Parrott, Steve Levine, and Susan Ravlin, were an indispensable aid to us. We also thank Katharita

Lamoza of Cambridge University Press for her tireless effort as production editor of this book. Thanks are also due to the National Science Foundation for the resources in the form of a grant (BNS 83–18077) that enabled us to explore some of our ideas empirically as well as theoretically, that allowed all three of us to get together, and that kept the project moving. In addition, we would like to acknowledge the support provided to some of our pre- and postdoctoral students through a training grant from the National Institute of Mental Health (MH 15140). We also want to express our gratitude to the Center for Advanced Study at the University of Illinois for granting two of us fellowships in successive years that allowed us to devote significant portions of our time to completing this book. Most of all, however, we thank our wives for putting up with us during years of obsessive discussions.

Andrew Ortony
Gerald L. Clore
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1 Introduction

Emotions have many facets. They involve feelings and experience, they involve physiology and behavior, and they involve cognitions and conceptualizations. There are important questions that can be asked about the expression of emotions, especially through the face, and the language of emotion constitutes an interesting research domain in its own right. In this book we are primarily interested in the contribution that cognition makes to emotion. The most general issue we shall address concerns the question of emotional differentiation—the question of what distinguishes one emotion from another—and our approach will be concerned more or less exclusively with trying to characterize the differences between emotions in terms of the different kinds of cognitions we take to be responsible for them. Taking the perspective of empirical psychology and cognitive science, we start with the assumption that emotions arise as a result of the way in which the situations that initiate them are construed by the experiencer. Our general plan is to try to impose some structure on the limitless number of possible emotion-eliciting situations. This is primarily an undertaking in theoretical psychology, although our proposals are intended to be consistent with existing data, as well as making their own empirically testable predictions. What we are trying to do, therefore, is to specify the “psychological” structure of emotions in terms of personal and interpersonal situation descriptions. Given these goals, we make no attempt to review the massive literature on the diverse aspects of the psychology of emotion. Such a review would only dilute our own efforts. Furthermore, we think it improbable that we could improve on the many excellent reviews that already exist (e.g., Frijda, 1987; Leventhal & Tomarken, 1986; Strongman, 1978).

The theory we propose is decidedly *not* a theory about emotion *words*. Indeed, our characterizations of emotions are intentionally cast in terms that are as independent of emotion words as possible, partly because we believe that the structure of the emotion lexicon is not isomorphic with the

structure of emotions themselves, and partly because a theory about emotions has to be a theory about the kinds of things to which emotion words refer, not about the words themselves. We consider the enterprise of mapping emotion words onto emotion structures to be quite separate from that of trying to characterize the structure of emotions themselves, and one that is better postponed until the structural questions have been resolved. Accordingly, we devote relatively little attention to the serious investigation of the relation between emotion types and the linguistic tokens associated with them. Nor do we devote much attention to other important aspects of emotion, such as the physiological, behavioral, or expressive components. This neglect is not because we think these aspects unimportant, but because we wish to start earlier in the causal chain. We think that emotions arise as a result of certain kinds of cognitions, and we wish to explore what these cognitions might be. The physiological, behavioral, and expressive aspects of emotions seem to us to presuppose that this first, cognitive, step has already taken place. Certainly, these aspects would be crucial to a complete answer to the question of what an emotion is, but we think they are less central to answering the question of where emotions come from.

Having emphasized that we are not attempting to define emotion words, we should also emphasize that we think our account is, in principle, capable of accommodating the fact that there are significant individual and cultural differences in the experience of emotions. Our claims about the structure of individual emotions are always along the lines that *if* an individual conceptualizes a situation in a certain kind of way, *then* the potential for a particular type of emotion exists. However, we do not attempt to specify the mechanisms that determine whether some particular situation will be conceptualized in one way or another. The question of how a situation is conceptualized in the first place, which we take to be the locus of individual and cultural differences, is a problem that is general for cognitive psychology, not one that is specific to the study of emotions. By attempting to be very specific about what emotions there are or could be, and about the particular factors that influence their intensity, we hope to achieve two goals. First, we seek to bring some semblance of order to what remains a very confused and confusing field of study. Second, we would like to lay the foundation for a computationally tractable model of emotion. In other words, we would like an account of emotion that could in principle be used in an Artificial Intelligence (AI) system that would, for example, be able to reason about emotions. Both of these goals require a level of specificity that has not been characteristic of previous work in the field. The degree to which we succeed in accomplishing them remains to be seen.

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