From: THE NATURE OF EMOTION
P. Ekman & R. Davidson (Eds.)
Oxford University Press, 1994

All Emotions Are Basic

PAUL EKMAN

The phrase *basic emotions* has been used in a number of different ways by emotion theorists. My use of the term *basic* is to emphasize the role that evolution has played in shaping both the unique and the common features that emotions display, as well as their current function. Innate factors play a role in accounting for both the characteristics shared by emotions and for those that distinguish one emotion from another.

Emotions evolved for their adaptive value in dealing with fundamental life tasks. There are a number of ways to describe these fundamental life tasks. Johnson-Laird and Oatley (1992) say they are "universal human predicaments, such as achievements, losses, frustrations, etc. . . . [E]ach emotion thus prompts us in a direction which in the course of evolution has done better than other solutions in recurring circumstances that are relevant to goals." (See also Lazarus's discussion of core relational themes, 1991, p. 202, and also Stein & Trabasso, 1992).

Tooby and Cosmides emphasize the crucial role of evolution in understanding our emotions today, telling us that emotions impose "on the present world an interpretative landscape derived from the covariant structure of the past." Emotions they say deal with recurrent "adaptive situations[,] [f]ighting, falling in love, escaping predators, confronting sexual infidelity, and so on, each [of which] recurred innumerable times in evolutionary history" (1990, pp. 407–408). What distinguishes emotions from other psychological phenomena, I believe, is that our appraisal of a current event, and at least some of our responses to it, is influenced by what Tooby and Cosmides have called our ancestral past.

Some years ago I described the nature of that appraisal as follows.

> There must be an appraiser mechanism which selectively attends to those stimuli (external or internal) which are the occasion for . . . [one or another emotion]. Since the interval between stimulus and emotional response is sometimes extraordinarily short, the appraisal mechanism must be capable of operating with great speed. Often the appraisal is not only quick but it happens without awareness, so I must postulate that the appraisal mechanism is able to operate *automatically*. It must be constructed so that it quickly attends to some stimuli, determining not only that they

> pertain to emotion, but to which emotion . . . . Appraisal is not always automatic. Sometimes the evaluation of what is happening is slow, deliberate and conscious. With such a more extended appraisal there may be some automatic arousal, but perhaps not of a kind which is differentiated. The person could be said to be aroused or alerted, but no specific emotion is operative. Cognition plays the important role in determining what will transpire. During such extended appraisal the evaluation may match to the selective filters of the automatic appraiser . . . . It need not be, however; the experience may be diffuse rather than specific to one emotion (Ekman, 1977, pp. 58–59).

This view of appraisal is similar to positions subsequently developed by Zajonc (1985) and Ohman (1986).

Automatic appraisal does not simply and solely operate on what is given biologically, dealing only with stimulus events that exactly fit what is given. In all likelihood not enough is given for automatic appraisal to ever operate without considerable amplification and detailing through social learning. (See especially Ohman, 1986, on this point.) Individual differences in our experience allow for enormous variations in the specifics of what calls forth emotion that are attributable to personality, family, and culture. And yet what calls forth an emotion is not totally malleable—there are some commonalities.

> The ancestrally recurrent structured situation that the organism categorizes itself as being in is the "meaning" of the situation for that organism. It "sees," i.e., is organized to respond to, previous fitness contingencies, not present ones. . . . Emotions . . . lead organisms to act as if certain things were true about the present circumstances whether or not they are because they were true of past circumstances. . . . In this lies their strength and their weakness. . . . [The automatic appraisal] cannot detect when the invariances that held true ancestrally no longer obtain (Tooby & Cosmides, 1990, pp. 418–419).

Let me more briefly describe some other characteristics of emotion that directly follow from viewing emotions as having evolved to deal with fundamental life tasks in ways that have been adaptive phylogenetically. (1) There are some common elements in the contexts in which emotions are found to occur, despite differences due to individual and cultural differences in social learning. (2) Emotions are likely to be observable in other primates. It is possible that there might be some emotions unique to humans, but no convincing evidence exists that is so. (Of course, we should also note that the capacity to represent emotional experience in words changes many aspects of emotional experience in ways which I cannot describe here.) (3) Emotions can begin so quickly that they can happen before one is aware that they have begun. Quick onset is central to the adaptive value of emotions, mobilizing us quickly to respond to important events.

It is also adaptive for the response changes that can occur so quickly not to last very long unless the emotion is evoked again. Here is not the place to argue about just how long an emotion typically lasts, but certainly it is not hours or days, but more in the realm of minutes and seconds. I believe those who claim emotions endure for much longer time periods are summating what is actually a series of briefer emotion episodes.

Because emotions can occur with a very rapid onset, through automatic appraisal, with little awareness, and with involuntary changes in expression and physiology (which I will describe), we often experience emotions as happening to us, not as chosen by us. We do not simply decide when to have a particular emotion. "An automatic involuntary aspect is present in the experience of all emotion" (Stein & Trabasso, 1992).

I have so far characterized emotional responses in terms of their potential for quick onset, brief duration, and involuntary nature, such that they are experienced as happening to us rather than as chosen. Let me now describe two further aspects of emotion, their physiology and expression.

There is evidence (Ekman, Levenson, & Friesen, 1983; Levenson, Ekman, & Friesen, 1990) for distinctive patterns of autonomic nervous system (ANS) activity for anger, fear, and disgust, and it appears that there may also be a distinctive pattern for sadness (Levenson, Carstensen, Friesen, & Ekman, 1991). These findings have now been replicated in four separate experiments, in two different age groups. Although there are some inconsistencies between the ANS patterns found and the findings of other investigators, we should not ignore the many consistencies with the results of Schwartz, Weinberger, and Singer (1981), Ax (1953), Roberts and Weerts (1982), and Graham (1962).

The only recent challenge to our findings was Stemmler's (1989) report that ANS patterning was specific to how the emotion was elicited. However, this may be due to a number of methodological problems including measuring physiology a considerable period after the induction was over and studying very low emotional intensities, as well as including a substantial number of subjects who reported not experiencing the emotion.[5] We have preliminary evidence in two different studies (Ekman & Davidson, 1993; Levenson, Carstensen et al. 1991) of the same emotion-specific pattern when emotion was elicited in very different ways.

We presume that these ANS patterns evolved because they subserve patterns of motor behavior that were adaptive for each of these emotions, preparing the organism for quite different actions. For example, fighting might well have been the adaptive action in anger, which is consistent with the finding that blood goes to the hands in anger. If no specific pattern of motor activity had survival value for an emotion, then there would be no reason to expect a specific pattern of ANS activity to have been established for that emotion. That is why I think we have not found an emotion-specific pattern, a pattern that differs from each of the other emotions, for either surprise or enjoyment.

I have no argument with Davidson's belief that approaching versus withdrawing is a fundamental issue in terms of the action plans associated with each basic emotion. But there is no definitive evidence to show that all positive emotions always involve just approach. And certainly anger, fear, and disgust can involve approach or withdrawal. Is Davidson arguing that for each emotion, evolution prepares us to *either* approach or avoid, and only social learning may add the other action pattern? If that was so, it might be possible to measure electromyographically the beginning of that tendency even when the action taken is different. For now, I propose we do not regard either an action readiness or emotion-specific ANS activity as the *sine qua non* for defining emotions.

However, it is necessary to posit emotion-specific central nervous system (CNS) activity in my account of basic emotions. The distinctive features of each emotion, including the changes not just in expression but in memories, imagery, expectations, and other cognitive activities, could not occur without central nervous system organization and direction. There must be *unique* physiological patterns for each emotion, and these CNS patterns should be specific to these emotions and not found in other mental activity. Here I am reaching far beyond the data, but not far beyond what the new techniques for measuring brain activity may allow us to discover in this decade of the brain.

I have so far described seven characteristics of emotion: automatic appraisal, commonalities in antecedent events, presence in other primates, quick onset, brief duration, unbidden occurrence, and distinctive physiology. I believe the evidence will show that these characteristics are found in amusement, anger, awe, contempt, contentment, disgust, embarrassment, excitement, fear, guilt, interest, pride in achievement, relief, sadness, satisfaction, sensory pleasure, and shame. Not all of these emotions are known to have a distinctive, universal signal, the last characteristic I will consider.

Emotions could have all the features I have described and not communicate any information to others, but in fact at least some emotions often do. A distinctive universal signal has been identified for anger, fear, disgust, and sadness (see Ekman, 1989, for a review of the evidence and arguments about universals). There is argument about contempt (Ekman & Friesen, 1986; Ekman, O'Sullivan, &Matsumoto, in press; Russell, in press), and some newly emerging evidence for embarrassment (Keltner, personal communication, October 1991).

There has been no study of a possible signal for awe, and it is not certain if there is a signal for either excitement or interest (which unlike Tomkins, 1963, or Izard, 1971, I consider to be separate states). I believe the evidence is also not definitive for a separate signal for guilt or shame, which differ from the sadness signal. While there is evidence of a universal signal for surprise, there are other reasons for doubting whether surprise is an emotion (see Ekman, 1992).

A universal signal should not *ipso facto* be considered evidence of an emotion. Nor should the lack of a universal signal be used to say a phenomenon is not an emotion. We should, however, expect to find that emotions that do not have distinctive signals differ in other ways, which I do not have space here to describe, from emotions that do have universal signals.

Most interesting is the likelihood that positive emotions such as amusement, contentment, excitement, pride in achievement, satisfaction, sensory pleasure and relief, all share a single signal—a particular type of smile (Ekman, Davidson, & Friesen, 1990). I am convinced from the research I and others have done on facial expression that no other facial signals will be found that differentiate among these positive emotions. Perhaps a distinctive vocal signal will be discovered.

There are other characteristics of emotion beyond the eight I have described, which deserve and are receiving study. Of particular importance is when emotions appear developmentally, how emotions regulate the way in which we think, and the subjective experience of emotion.

A caveat about thinking of emotions in terms of the characteristics they share. Emotions also differ from each other, as, for example, some may not have distinctive

signals. There may be some characteristics that are very important for one emotion and of little significance for another. It may never be possible to have an adequate comprehensive theory of emotion. Instead we may need to have a separate theory for each emotion, to best capture its uniqueness.

Before closing, let me mention the concept of emotion families that may help to clear away some of the argument about how many emotions there are. Each emotion is not a single affective state but a family of related states. Each member of an emotion family shares the eight characteristics I have described. These shared characteristics within a family differ between emotion families, distinguishing one family from another. Put in other terms, each emotion family can be considered to constitute a theme and variations. The theme is composed of the characteristics unique to that family, the variations on that theme are the product of individual differences, and differences in the specific occasion in which an emotion occurs. The themes are the product of evolution, while the variations reflect learning.

By now it should be clear that I do not allow for nonbasic emotions. Every emotion has at least seven of the characteristics I have described. These characteristics allow us to begin to deal with fundamental life tasks quickly without much elaborated planning in ways that have been adaptive in our evolutionary past. Emotions do also typically include informing others which specific negative emotion is occurring or if a positive emotion of some kind is occurring. Much research needs to be done to delineate each of the characteristics I have described, to discover other characteristics shared by these emotions, and to determine whether there are indeed other emotions beyond those I have described.

Note

Much of this reply is drawn from a longer article on this topic, "An Argument for Basic Emotions," which appeared in *Cognition and Emotion*, Spring, 1992. I have, however, changed some of my views in this presentation. The preparation of that article was supported by a Research Scientist Award from the National Institute of Mental Health (MH 06092).