

Chapter Seventeen

The Nature of Emotion

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Most topics studied by social psychologists involve emotion in some way. Consider how cognitive dissonance is motivated by anxiety about self-esteem, or how conformity is influenced by the embarrassment of conspicuous deviation and the contentment of belonging. The list is impressively long: social comparisons generate envy, dejection, and pride; social anxiety underlies many group processes; romantic relationships have their love and jealousy, aggression its anger, altruism its sympathy, and persuasive communications almost any emotion one can name. Emotions, then, are at the heart of many social psychological phenomena.

This chapter presents an overview of perspectives on the nature of emotion. The first section discusses foundational issues in the study of emotion, including its definitions, the functions of emotion, and the general approaches that have been taken in studying it. The general thesis is that emotion spans all of the levels of analysis that psychologists apply to their subject matter: to reduce them to three, these are the social and cultural, the cognitive, and the physiological. The remainder of this chapter describes emotion at each of these three levels and presents some of the most important issues and findings that may be gleaned from each.

Definitions, Conceptions, and Basic Issues

Defining emotion

Although there is no single, agreed-upon definition of emotion, there is considerable consensus that emotional states are best thought of as processes that unfold in time, involving a variety of components. Whether these components are necessarily or only typically part of emotions is a matter of some debate. The beginning of an emotional episode typically includes an evaluative perception of the nature of the situation, known as an *appraisal*

(Lazarus, 1991). An emotional appraisal evaluates events or objects as significantly affecting a person's concerns, goals, or values in a positive or negative way. The presence of appraisals is one reason why many theorists have argued that emotions have a cognitive aspect (e.g. Solomon, 1976), although, as I will discuss later, not all theorists are persuaded that appraisals are necessary.

Emotional reactions can involve changes in thinking, behavior, physiology, and expression. The effects of these changes may influence readiness to think and act in certain ways, as well as signal this readiness to others, thereby affecting social interaction and relationships. The development of an emotion over time depends on how the situation is evaluated and coped with. In a narrow sense, an emotional state ends when attention is drawn to another issue, but, in a larger sense, the emotional episode may be said to continue until such point as the evaluation of the event changes significantly (Frijda, Mesquita, Sonnemans, & Van Goozen, 1991). In summary, then, an emotion can be loosely defined as a reaction to personally significant events, where "reaction" is taken to include biological, cognitive, and behavioral reactions, as well as subjective feelings of pleasure or displeasure. The issues surrounding the definition of emotion have been reviewed in several recent volumes (e.g. Ekman & Davidson, 1994; Russell, Fernández-Dols, Manstead, & Wellenkamp, 1995).

Even with such a loose definition it is important to realize that the meaning of "emotion" in academic psychology often differs somewhat from that in ordinary language. First of all, the general term "emotion" plus the terms for specific emotions such as "sadness" and "shame" are all words in the English language, and these words often have no precise equivalents in other languages (Wierzbicka, 1992). Whether psychologists can or should strive for definitions that span cultural and linguistic boundaries is unclear (Russell, et al., 1995). Second, the everyday connotation of "emotion" often includes the judgment that the response is in some way exceptional, such as by being excessive, inappropriate, dysfunctional, immoral, or praiseworthy. Emotion terms have developed for the purposes of everyday speakers of the language; these purposes often include judgments of the appropriateness of a person's actions, but social psychologists do not necessarily share those purposes. Finally, in everyday usage, the term "emotion" refers to a wide range of phenomena that have little in common. The concept of emotion is fuzzy around the edges. For example, there is little doubt that anger and sadness are emotions, but there is less agreement about whether to include moods (depression, irritability), long-term emotions (love that continues for years), dispositions (benevolence, cantankerousness), motivational feelings (hunger, sexual arousal), cognitive feelings (confusion, *deja vu*), and "calm" emotions (sympathy, satisfaction).

If the goals of research require fidelity to everyday usage, loose definitions of emotion appear to be the best that are possible. In order to be true to the everyday usage of the word "emotion," many investigators have proposed that its meaning be represented as a "fuzzy category" with no precise definition (Fehr & Russell, 1984). This representation is often proposed to have the structure of a script or narrative (Shaver, Schwartz, Kirson, & O'Connor, 1987). On the other hand, if the goals of research are to develop objective understanding of aspects of emotion independent of folk conceptions, the preferred strategy may be to develop more precise definitions independent of everyday usage (Clore & Ortony, 1991). For example, for purposes of research it may be helpful to postulate attributes that will be considered necessary and sufficient for a psychological event to be

considered an emotion. Researchers seeking this latter goal must be careful to distinguish their concepts from everyday conceptions that may bear the same labels.

Relation of emotions to other aspects of mind

For centuries, philosophers and psychologists have found it convenient to distinguish between different aspects of the mind. Plato, in *The Republic*, has Socrates argue that the soul can be divided into three parts: an appetitive part that produces various irrational desires, a spirited part that produces anger and other feelings, and a reasoning part that permits reflection and rationality. This tricotomy shows similarity to one expressed in contemporary psychology between *conation*, the aspect of mind directed toward action, *affect*, the aspect of mind involving subjective feeling, and *cognition*, the aspect of mind involving thought.

It is certainly legitimate to observe that mental activity involves these aspects, and there is no doubt that a valid conceptual distinction can be made between them. Nevertheless, disagreement and confusion has resulted from these distinctions because some psychologists have treated these *aspects* of the mind as if they were *distinct parts* of the mind, whereas others have not. The rationale for separating these aspects of mind is usually based on the fact that people sometimes feel an emotion that they believe to be irrational, or fail to feel an emotion they believe to be warranted. Such conflicts can make it appear that motivation, emotion, and cognition can act as independent entities, and some theorists have been persuaded to adopt such a view, although it then becomes necessary to account for the many ways that these entities influence one another (see chapter 18, this volume). Other theorists, however, stress that emotions have both cognitive and motivational qualities, and therefore think of these elements as referring to different *aspects* of mental events, not as corresponding to actual separations within the mind (e.g. Peters, 1958).

Level of analysis

In any science, phenomena can be studied at any of several levels of analysis. For example, in the physical sciences water can be considered from the points of view of the elementary particles and forces of physics, or of the atoms and molecules of chemistry. In the biological sciences evolution can likewise be studied at a variety of levels, ranging from molecular genetics to ecology. The same is true in psychology, with emotion serving as a good example. Emotion can be studied in terms of biology, of thinking, and of the social context. The choice of level of analysis determines a number of important aspects of research, including the choice of measures. On the biological level, emotions are measured in terms of activity in the nervous system and in terms of changes in the periphery of the body (e.g. sweaty palms, muscle tension). On the cognitive level, measures might include people's ratings of their beliefs about the cause of a certain event, their expectations that a certain action will bring about a certain end, or their attention toward or away from certain classes of stimuli. On the social level, measures might include the amount of time people spend making eye contact, changes in how people are perceived, or changes in interpersonal relationships.

Other levels of analysis could be distinguished from these, but these three are sufficient to illustrate the basic point, which is that no one level of analysis is more central or more “scientific” than any other. Each addresses important aspects of emotion, and a complete understanding of emotional phenomena often requires that insights from all three be combined.

Function

What is the function of the emotions? Some have construed emotions as either dysfunctional or, at best, as lacking function. For example, the Stoics, such as Epictetus and Marcus Aurelius, believed that (most) emotions were the result of erroneous thought and should be avoided. More recently, Charles Darwin (1872/1955) understood emotional expressions as vestigial movements that formerly had functions in our evolutionary past but are now mostly useless, and philosopher Jean-Paul Sartre (1948) characterized emotions as ways of avoiding responsibility and truth. Arguments for the dysfunctionality of emotions thus encompass the biological, cognitive, and social levels of analysis.

Others, however, have maintained that emotions serve a variety of useful functions, and their functionalist approaches to emotions can be found at all levels of analysis, too. Ironically, the theory that has been most influential in this regard is that of Darwin, whose theory of natural selection, not his theory of vestigial emotional expression, has formed the basis of post-Darwinian evolutionary biology. Evolutionists use the theory of natural selection to understand emotions as adaptations that often serve useful functions. They argue that, although emotions can sometimes be maladaptive or inappropriate, anything as common and significant as emotions must have been subject to evolutionary pressures, so animals possessing emotions must have had some advantages over animals that did not. This argument, of course, leaves open the possibility that emotions were advantageous to our ancestors in their habitats but are no longer useful to us in ours. There are some emotions that seem to be of this latter type: some of our reactions to stress, such as increases of heart rate and of certain hormone levels, seem much more useful in fleeing from predators than in preparing for presentations, and these responses may be responsible for such stress-related illnesses as heart attacks and stomach ulcers (Selye, 1976). But, on the whole, it is generally thought that emotions serve useful roles of various sorts. At the biological level, they can be viewed as preparing the body for actions that are usually adaptive in the situations that produce the emotion (Frijda, 1986). Functionalism may be found at the cognitive level of analysis as well. The theory of Oatley & Johnson-Laird (1987) finds functionality in the way that emotions alter a person’s priorities, thereby serving to allocate limited resources among multiple plans and goals. At the social level, emotions’ functions have been examined in units as small as the interactive dyad (e.g. communication of social intentions: Fridlund, 1994) and as large as an entire culture (e.g. to express and fortify cultural values and social structures: Lutz, 1988). For a thorough review of functionalist perspectives see Gross & Keltner (in press).

This range of opinions about the functionality of emotions can be rather confusing. It may be that it results in part from confusions between the academic and everyday meanings of “emotion.” Theorists using the everyday sense may be more likely than theorists

using an academic definition to consider cases that are irrational, that result from ulterior motives such as the need for self-esteem, or that are otherwise especially likely to be maladaptive. Yet the disagreements are not only definitional. Another problem is that emotions do not have fixed effects; any given category of emotion, such as anger or happiness, can motivate a variety of expressions and actions, and socialization and choice of self-regulation strategies can have an enormous effect on whether a particular emotion is adaptive or maladaptive (Parrott, in press). Perhaps a reasonable compromise position is that emotions have the potential to be functional and adaptive, but only if socialized and regulated to be appropriate for the particular context in which they occur. Further research on the ways in which emotions may be functional or dysfunctional would be helpful in improving understanding of this issue.

Social and Cultural Approaches to Emotion

To take a social approach to emotion is to focus on how emotion pertains to social situations and relationships. Many emotions have to do with our appearance to others, our relationships with others, our duties toward others, and our expectations of others. Communication, culture, and the social functions of individual emotions thus form the main emphases of the social approach.

Communication

The social nature of emotion is apparent when considering how people communicate their emotions to others and how they recognize others' emotions. Considerable research has investigated the ways in which such communication takes place in humans and animals. Charles Darwin (1872/1955) is the person most responsible for directing attention to expressions of emotion. Research by Ekman (1973) and others has extended Darwin's work, suggesting that there exists a set of human facial expressions that are universally recognizable and innate. These facial expressions include those of sadness, fear, joy, anger, disgust, and surprise.

Certain limitations to the research paradigms employed to date have led some to question the validity of this conclusion. The use of still photographs of posed facial expressions and of forced-choice response formats, for example, might compromise the validity and ecological relevance of the findings (Russell, 1994). Moreover, controversy exists about how to interpret the meaning of facial expressions. According to Ekman, facial expressions of emotion automatically occur when emotions are experienced. To some extent, they may be suppressed, modified, or exaggerated to conform with social conventions, known as *display rules*, but there nevertheless exists an innate connection between facial expressions and emotional experience. This theory has been challenged by Fridlund (1994), who argues that facial expressions of emotion do not so much express an inner emotional state as they communicate intentions and wishes to others. At present there does not seem to be decisive evidence favoring either approach. The disagreement has spurred a new wave of

theory and research on nonverbal expressions (see Russell & Fernández-Dols, 1997). Future theoretical developments may well involve a combination of current theories.

Social constructionism

The current debate about facial expressions addresses a second issue as well, the question of whether emotions are universal or differ across cultures. The position that emotions are universal is well represented by Ekman's approach, and is usually justified in terms of the genetic basis of human emotionality, which is approached at the biological level of analysis described later in this chapter. The position that human emotions are shaped by particular cultures is necessarily approached at the social and cultural level of analysis. *Social constructionism* is the thesis that, to some extent, emotions are the products of culture. (See Harré, 1986, and Harré & Parrott, 1996, for collections of articles reflecting this approach.)

According to social constructionists, human cultures influence the emotions by influencing the beliefs, values, and social environment that members of the culture possess. The emotions may be understood as being enmeshed within an entire system of beliefs and values, so an emotion can hardly be said to exist independent of the culture of which it is a part. Consider, for example, an emotion that existed in Western cultures in medieval times but seems to have become extinct by the year 1400 or so: *accidie*. Accidie occurred when one was bored with one's religious duties and procrastinated in carrying them out; one felt both bored and also sad about one's religious failings and the loss of one's former enthusiasm for religious devotions. The cure for accidie was to resume one's religious duties and to feel joyful in doing so. The emotion was intimately tied to a set of moral values concerning one's religious duties; to feel it at all was a sin. The emotion faded from existence when values changed during the Renaissance. Now, when people in Western cultures are bored and procrastinate, they feel guilt, an emotion that is related to a culture based on individual responsibility, not one of spiritual duty (Harré & Finlay-Jones, 1986). The implication is that cultural beliefs and values make certain emotions possible, and that the same culture may permit a somewhat different set of emotions at one time than at another.

A similar point can be made about two different cultures existing at the same time. The anthropologist Lutz (1988) argues that the emphasis on social relationships and sharing that exists in the South Pacific atoll of Ifaluk gives rise to emotions that are not equivalent to any Western emotion. *Fago*, for example, is something like our sadness, but it differs by being specific to a close relationship toward a less fortunate person – a person in need – to whom one feels compassion. This point has been made by studying a culture in depth, as Lutz did, and also by comparing multiple cultures. For example, Markus & Kitayama (1991) have argued that cultures may be plotted along a dimension of self-construal that ranges from being relatively independent with others at one extreme to being relatively interdependent of others at the other. They argue that “ego-focused” emotions such as anger, frustration, and pride will be experienced more by people with relatively independent selves, whereas “other-focused” emotions such as shame, belongingness, and sympathy will be experienced more by people with relatively interdependent selves. (For a review of cultural perspectives in social psychology, see chapter 2, this volume.)

Social functions of emotions

Regardless of whether emotions are considered to be universal or culturally relative, the social level of analysis is characterized by attention to the ways that emotions function in social situations. This attention is often best directed to particular emotions rather than to the broad category of emotion in general. For example, anger has been found to play important roles in the regulation of interpersonal behavior in many North American cultures. Anger is part of a system that enforces normative standards, arising when a person interprets another's actions as a voluntary, unjustified transgression, and often functioning to repair the relationship between the angry person and the target of the anger (Averill, 1982).

Studies of shame, guilt, and embarrassment have suggested that these emotions can function to motivate behavior that conforms to social and moral norms and that makes restitution for past misdeeds. Shame is generally found to focus on the adequacy of a person's self, or on the exposure of that self to public disapproval; guilt, in contrast, is generally found to focus more on particular misdeeds and to be more the result of a person's private conscience than of public exposure (for a comprehensive review, see Tangney & Fischer, 1995). Embarrassment is in some ways similar to shame, in that it is linked to public exposure, but may be distinguished from it in several ways: unlike shame, it does not require belief that one is immoral or defective, and it is not experienced in private. Embarrassment results from the perception that the present social situation is socially awkward, often (but not necessarily) because others perceive the self in some negative way. Embarrassment thus motivates people to mind how they are perceived by others, to behave in role-consistent ways, and generally to conform (for a review, see Miller, 1996).

Envy and jealousy may also be considered from the standpoint of their social functions. "Envy" refers to the painful or negative emotion experienced toward a person who has what oneself wants but lacks. It typically includes a mix of hostility and inferiority. The emotion can motivate achievement and innovation to catch up with the rival, or hostility to undercut the rival's advantage. There is wide variation in the extent to which expression of envy is tolerated in different cultures, and thus in the extent to which it is necessary for those with enviable qualities to fear the envy of others (Schoeck, 1969). Because of fear of envy, self-presentations often conceal or downplay a person's successes and advantages. The word "jealousy" can be used to refer to envy, but it can also be used to refer to a quite different type of emotional reaction, one that requires a more complex set of relationships among three people rather than just two. Jealousy, in this sense, is an emotion that occurs when one person perceives that his or her relationship with another person is threatened by a rival who could take the jealous person's place. Like envy, jealousy comes in a variety of forms, but these generally may be seen as motivating a person to protect and nurture the threatened relationship or, if it is too late for that, to cope with its loss. Salovey (1991) provides a good collection of articles on envy and jealousy.

There are, of course, many more emotions that can be studied at the social level of analysis, but this sample will serve to illustrate the approach.

Cognitive Approaches to Emotion

The way people think is clearly related to their emotions. This is not to say, of course, that the social or the biological approach is “wrong,” only that it is often helpful to talk about emotions as a set of beliefs or a mode of information processing rather than as a social role or a set of events in the brain (even though the cognitions are socialized by culture and require brain activity). On the cognitive level of analysis certain truths about emotion are more readily apparent than at other levels of analysis.

One clear advantage of the cognitive level is that it facilitates discussion of a person’s beliefs. Emotions usually occur because events have been interpreted in a certain way, and, once emotions occur, people often think in a somewhat altered manner. Thus, certain types of thinking characteristically precede emotion, and emotions themselves involve ways of thinking as well as social functions and bodily responses. Each of these cognitive aspects of emotion has been the topic of investigation by psychologists.

Appraisal

The thinking that leads to emotion is usually called the *appraisal*. It is characterized by an assessment of the current situation and its implications for the well-being of oneself and the things that one cares about. The classic experiments demonstrating the importance of appraisals in emotions were performed by Richard Lazarus, who asked people to watch movies showing extremely unpleasant scenes of people being mutilated in primitive rites or in woodworking accidents. Before viewing the films, some of the people were encouraged to interpret the filmed events as harmful and painful, whereas others were encouraged to deny the extent of the harm and interpret them as benign, and still others were encouraged to distance themselves from the victims and view the scenes in a more detached, intellectual manner. All of the people then viewed the same films, yet the first group experienced more stress and more intense, negative emotions than did the other two groups. After the film Lazarus asked the viewers to describe how they were feeling, and he also measured certain physiological symptoms of autonomic nervous system activity; the groups differed on both the self-report and the physiological measures. These experiments demonstrated how changes in cognitive appraisal could produce differences in the intensity of emotions that occur (Lazarus, 1966).

There is controversy over the type of judgments that should be included in the concept of “appraisal.” Some appraisals are quite careful and deliberate, as when one thinks through a remark one heard and only gradually realizes that it was inconsiderate and derogatory to oneself – and then one becomes angry. Many times, however, it seems that appraisals, if they indeed play a role in producing emotions, must be very quick, outside conscious awareness, and independent of our rational faculties.

There are two ways to resolve this dilemma, and a lively debate over which alternative is better occurred in the pages of *American Psychologist* (Lazarus, 1982, 1984; Zajonc, 1980, 1984). One resolution was advocated by Robert Zajonc (1980), who proposed that cognition and emotion may be conceived as two independent systems, often working together,

but capable of being at odds. Zajonc's theory can account for discrepancies between emotion and reason, but it does so in a manner that creates many problems. Why is it possible to call certain emotions "irrational" if emotions do not intrinsically entail beliefs? Why does emotional development seem to require cognitive development (e.g. children don't get embarrassed until they know about social roles and appearances)? Most emotions are "about" something, such as "not studying for the test," but it seems necessary to be cognitive to be "about" something. In short, there is a host of problems with proposing a separation between emotion and cognition (Lazarus, 1982; Solomon, 1976). The most important problem is the fact that the way in which a person thinks about a situation obviously affects how he or she feels. If one becomes angry when one discovers that one's friend has once again left a pile of dirty dishes in the sink, and then discovers that the friend had been about to do the dishes when he received news about the death of his father, one's anger goes away and different emotions (surprise at the news, feeling sorry for your friend) take its place. The dual system account appears to deal only awkwardly with such an ordinary case.

A different alternative to Zajonc's "dual system" solution is suggested by such theorists as Lazarus (1982) and Beck (1976), both of whom view emotion as always linked to cognition. The key to their solutions is a claim that is routinely made about non-emotional cognition as well, namely, that there are *different types* of cognition, and that not all cognition is conscious, deliberate, or verbal (Parrott & Sabini, 1989).

Recognizing that cognition can be difficult to control and that people can persevere in beliefs that they recognize to be undesirable permits one to account for conflicts between emotion and reason in a manner that nevertheless conceives of emotion as involving cognition, and many psychologists prefer this solution for this reason. Other psychologists prefer Zajonc's dual systems solution. More recent criticisms of research on appraisal have focused on whether appraisals are necessary causes of emotion. Critics contend that appraisals are but one of many causes of emotions, some of which are best understood at the social or physiological levels of analysis (Parkinson, 1997). Continuing debate over this issue can be expected in years to come.

Regardless of the outcome of this debate, it is clear that in most cases there is a good deal of agreement between a person's way of thinking and the emotions that person feels, and much research has been directed at characterizing the types of assessment that are associated with different emotions. That is, what thoughts lead to what emotions? Logical and experimental analysis suggests that emotions can be classified according to the type of beliefs that underlie them (Ortony, Clore, & Collins, 1988). Many emotions have to do with reactions to events, and these emotions can be subcategorized according to whether the event is judged simply according to desirability (joy) or undesirability (distress), or whether further judgments are also involved. For example, if the event is desirable for *another* person, one may be pleased about this (happy-for) or displeased (resentment). And if one is anticipating a future event, one may have an emotion if this event would be desirable (hope) or undesirable (fear). And if one has pleasant anticipations, they may later be dashed (disappointment) or confirmed (satisfaction), and if one has unpleasant anticipations, they too may later go unrealized (relief), or be confirmed ("fear confirmed"). For other emotions the cognitive focus is less on the event itself than it is on the people who are *responsible* for the event. If other people are believed to be the agents responsible

for the event, then one may find their actions praiseworthy (admiration) or blameworthy (contempt). If one believes oneself to be responsible for the event, then one may find one's own actions to be praiseworthy (pride) or blameworthy (shame). Some emotions seem to combine assessments of responsibility with assessments of the consequences of the events for oneself or for others; emotions such as anger, gratitude, remorse, and gratification are of this hybrid type. Anger, for example, combines distress over an undesired event with reproach of an agent responsible for producing it (Ortony, Clore, & Collins, 1988). Still other emotions seem related not to events or agents, but to our overall liking or disliking of a person or object: love and hate are common examples of this class. A variety of schemes for representing the appraisals associated with various emotions have been proposed, such as appraisal components or themes (for a review, see Smith & Pope, 1992).

Several conclusions may be drawn from these attempts at classification. First, not all emotion words correspond to a single, simple appraisal as do the ones mentioned above. Jealousy, for example, refers not so much to a single appraisal as to an entire syndrome of appraisals and emotions that are likely to occur in a certain situation, namely, when one faces the threat of losing a valued relationship to a rival. Envy (as used in modern English) similarly can refer to anything from longing or admiration of someone who has something desired by oneself to hatred of that person for being superior. It is therefore possible to distinguish single emotions from what might be called emotional *episodes* (Parrott, 1991).

It also becomes clear that the *concepts* of emotions that are being developed by researchers are not identical with the *emotion words* used in everyday language. For example, in the classification described above there is clearly a logical place for an emotion in which a person is pleased that an undesirable event has happened to another person – and, in fact, most people have experienced such pleasure at another's misfortune. The English language, however, does not have a good word for such an emotion. German does, though: they call it *schadenfreude*. This example illustrates that the correspondence between our language and our experience is imperfect.

Finally, analysis of emotional appraisals suggests the sort of things that determine what people get emotional about and thus, in a sense, what people care about. They care about their goals, plans, and values; they care about social relationships; they care about duties and responsibilities; they care about the good and evil in people's characters. It is assessments along these lines that define and distinguish the various emotions. There is no one perfect classification scheme for emotions. Which classification is best depends on one's purposes.

Emotion's effects on cognition

Given that cognition leads to emotion in these ways, what can be learned about how people think once they are emotional? Answers to this question tend to be of two types. Some accounts depict emotional thought as being biased by a person's *motivation*. Because it is often possible to construe events in more than one way, people may have a tendency to select interpretations that are most consistent with the way they wish the world to be. (See chapter 16, this volume, for a review of motivated biases.)

Not all accounts of emotional bias invoke motivation, however; some emotional biases

can be explained as the result of normal judgmental or memory processes. Being in an emotional state, say, of anger, may provide information about one's present situation (Schwarz, 1990), or may tend to remind one of previous times when one has been angry and of beliefs that are consistent with being angry (Blaney, 1986). (See chapter 18, this volume, for more detail about the ways in which emotions affect people's thinking.)

Two-factor theory

One application of the cognitive approach to emotion has come from investigating people's understanding of the causes of their own emotional feelings. Studies conducted in 1924 by the Spanish physician Gregorio Marañón suggested that most people injected with adrenalin reported feeling no emotion at all, or felt "as if" they were emotional but only in a cold or empty way. A very few people felt a genuine emotion, and these appeared to be people who had been thinking about emotional situations in their present lives. These findings led Stanley Schachter to propose that emotions consist of two components: physiological arousal *plus* cognitive attributions linking the arousal with emotional circumstances believed to have caused it (Schachter & Singer, 1962). This theory gave rise to an enormous amount of research over the following two decades in which researchers investigated its implications.

The one implication that has received consistent experimental support is that arousal from one source can intensify an emotion unrelated to the true source of the arousal. For example, people who are aroused because they have recently gotten off an exercise bicycle may feel angrier and act more aggressively after being insulted than do people lacking arousal. The people apparently feel angrier because they attribute their arousal to having been insulted. Evidence supporting this claim comes from findings that there is no increase in anger immediately after getting off the bicycle – at this point people have plenty of arousal, but they are aware that exercise caused it so do not attribute it to anger. Six minutes after getting off the bicycle there again is no increase in anger – at this point there is no more arousal. Two minutes after getting off the bicycle, however, people do feel more anger, apparently because they no longer attribute their lingering arousal to bike riding and instead misattribute it to having been insulted (Zillmann, 1979). Such findings, plus the original Marañón experiment, support the idea that Schachter's two-factor theory describes a genuine phenomenon, but this theory cannot seriously be considered as a general account of emotions. As will be described later, arousal is not necessary for emotional experience. Furthermore, the support for most other predictions of the theory is lacking (Reisenzein, 1983).

Physiological Approaches to Emotion

Physiological approaches to emotion may be divided into two types. The first type emphasizes the bodily symptoms of emotions: the pounding heart, dry mouth, sweaty palms, and "butterflies in the stomach" that are characteristic of many powerful emotions. This ap-

proach emphasizes regions of the body that lie beyond the brain and spinal cord in the periphery of the nervous system, and for this reason it may be termed the *peripheral approach* to emotion. The second physiological approach to emotion has the opposite emphasis, on brain activities that appear to be responsible for emotions. It may be termed the *central approach* to emotion.

The peripheral approach

The most influential statement of the peripheral approach was made by William James (1884), who tried to account for why emotions have the feeling qualities that they do. James proposed what he intended to be a very counterintuitive theory, namely, that emotional feelings are simply the awareness of various bodily changes. If one encounters a ferocious bear, James said, one first perceives the bear, and then one's body responds to this perception with increased heart rate, greater blood flow to the leg muscles, deeper breathing, widening of the eyes, and so forth. Emotions, James claimed, are nothing other than the awareness of such bodily changes – there is no “emotion” that precedes such changes.

The strength of James's theory is that it attempts to account for the “feel” of emotions, a task that most psychologists have shied away from despite its centrality to many conceptions of emotion. But there are many problems with James's view, some factual and some conceptual. One central prediction of the theory must be recognized in order to understand its problems. If we allow that there can be more than one type of emotion, and if emotions are simply our awareness of bodily changes, then it follows that different emotions must be characterized by different patterns of bodily changes and that these changes are what distinguish the emotions for us. This prediction has not fared well.

The most famous of the many attacks on James's theory was made by Walter Cannon (1927), who was an expert on the autonomic nervous system. One of the two parts of the autonomic nervous system, the sympathetic nervous system (SNS), is closely associated with many of the bodily responses characteristic of powerful emotions: it produces the “arousal” that formed part of Schachter's two-factor theory. The SNS controls a variety of responses that may be easily understood in terms of a scheme invented by Cannon himself: the SNS produces changes in the body that are needed for the *fight-or-flight response*. That is, in many emergency situations it is adaptive for animals to be able to mobilize all of the energy they can muster for a relatively short, intense burst of life-saving activity – to fight for its life or to flee from a predator or to escape from some catastrophe. The SNS affects the body so that adrenalin is produced, oxygen is absorbed, blood is pumped, energy is burned, and muscles work at their peak capacity. Cannon's research led him to conclude that the fight-or-flight response is almost always the same for such intense but otherwise different-seeming emotions as rage and fear. He also knew that the full SNS response often takes a second or more to occur, whereas people seem to experience emotions without such a delay. Furthermore, such non-emotional causes as exercise and fevers produce SNS arousal without emotional experience, and injections of adrenalin do not cause most people to feel an emotion. These and other facts persuaded Cannon that emotion could not be equated with the awareness of emotion-like changes in the body.

Subsequent investigations have supported most of Cannon's criticisms of James. Consider recent research on people who have suffered spinal cord injuries. Some spinal cord injuries not only confine people to wheelchairs, but also prevent them from receiving sensations from much of their bodies. If emotional feeling were dependent on sensations from the body, one would expect such people to experience emotions less strongly, but this is not the case – they experience emotions as intensely as they did before their injuries, as intensely as do people without injuries, and as intensely as people who have spinal cord injuries that do not block feelings from the body (Chwalisz, Diener, & Gallagher, 1988).

A conceptual problem also exists for James's theory. His claim – that people first perceive an event and then their bodies respond – appears to beg a crucial question: how does the body know how to respond appropriately? Clearly, what James called "perception" must involve more than just that. The event must be interpreted and evaluated for significance to some extent before an appropriate response can be made. The need for such an evaluation – an appraisal – is one of the main reasons that the physiological approach to emotion can be usefully supplemented by cognitive and social approaches.

But just because SNS arousal is not necessary for our emotional feelings it does not mean that this activity cannot contribute to our emotional experience or that it is not an important part of an emotional response. There is some evidence that bodily feelings contribute somewhat to emotional experience – smiling does seem to make people feel a bit happier than they do when not smiling, for example – but the contribution to emotional intensity seems fairly small compared to other factors such as the significance of the event (Laird, 1984). Emotional bodily changes evolved because they prepare the body to function in adaptive ways. Powerful emotions are characterized by a preparedness for emergency activity, and bodily changes are part of this preparation. Not all emotions are like this, however – consider sadness. Autonomic changes can also function as signs that a person is emotional; sometimes people recognize emotion in themselves and in others by noting the presence of SNS arousal, and the detection of such activity is the basis of so-called "lie detector" testing. A review of the peripheral approach to emotion may be found in Cornelius (1996).

The central approach

In response to Cannon's critique of James in the 1920s, researchers taking a physiological approach to emotion increasingly began to adopt what may be termed the *central approach*. Other researchers joined Cannon in proposing that there exist structures in the brain that are responsible for controlling many aspects of emotions, including the SNS. Papez (1937) and MacLean (1970) proposed that an interconnected set of structures located near the middle of the brain – called the *limbic system* – produced emotional feelings and responses.

Evidence for this claim is of several types. It is possible to stimulate activity in nerves by applying small amounts of electrical current to them, and stimulation of parts of the limbic system can produce emotional behavior. Damage to parts of the limbic system alters emotional behavior. Humans with epilepsy that alters the activity of the limbic system can undergo dramatic changes in emotion. Drugs that alter moods are known to work on the

nerves in the limbic system. Diseases that damage parts of the nervous system produce changes in mood and emotional behavior. For example, one part of the limbic system is a structure called the *amygdala*. Stimulation of regions of the amygdala can produce aggressive behavior, whereas damage to it can result in the reduction of aggression. Epileptic seizures focused on the amygdala can cause humans to go into a rage and violently attack others, and surgical removal of these regions (as last-resort treatment of epilepsy) can end these episodes of rage. Rabies is known to produce violent behavior, and it causes damage to the nervous system, particularly in the region around the amygdala. A few violent criminals have been found to have had brain tumors near the amygdala. Although there are good reasons to be cautious in interpreting these types of evidence, there does appear to be a general trend across many types of evidence linking structures in the limbic system to emotional thinking, feelings, and behavior (Frijda, 1986). A well-known synthesis of research in the centralist tradition would be that of LeDoux (1993).

Certain assumptions of the central approach do seem valid, then. It is possible to learn about emotions by studying the brain structures and processes that are associated with them. It is important to understand that the discovery of physiological processes linked with emotion does not mean that emotions are “just physiological,” however. The functions of the limbic areas appear to be linked to the evaluations, judgments, and feelings that go into emotion and to a variety of social and sexual functions. Emotions’ cognitive and social aspects require brain processes to occur and emotions can be studied on that level, but they cannot be understood completely without considering all three levels of explanation.

Conclusion

In this chapter we have seen how emotion has been studied in psychology at three different levels of analysis: the physiological, the cognitive, and the social and cultural. Insights have been gained from all three levels, and it should now be clear that the levels are complementary, not contradictory. The fact that different cultures can have somewhat different emotions in no way implies that these emotions do not have cognitive or physiological aspects as well, nor does the fact that modern antidepressant medications might have “cured” accidie imply that this emotion did not require a certain set of beliefs and institutions. One of the most important tasks of psychology is to understand the interrelations between these different aspects of emotion, and social psychologists are well-positioned to contribute to that understanding.

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