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Learning Objectives

By the end of this chapter you should appreciate that:

- emotions have been investigated via at least five main approaches, involving feelings, behaviour, arousal (physiology), cognition and social context;
- the measurement techniques of psychological science can significantly inform the study of emotion;
- different research methodologies have been used to investigate feelings, emotional behaviour, and physiological measurements of emotion;
- there is an important interaction between emotion and cognition, especially involving appraisal;
- the communicative functions of emotion differ between specific emotions such as fear, anger, happiness and sadness;
- some aspects of emotion are inherited, but emotion continues to develop throughout the lifespan;
- in extreme forms, emotions can be integrally involved in psychological disorders.

INTRODUCTION

Measurement is fundamental to any science, but there are obvious difficulties with the measurement of emotion. How do you measure somebody's anxiety? Through facial expressions? Through physiological indices such as heart rate? Simply by asking them?

The complexity of emotion sets limits on how psychologists can set about its scientific investigation and measurement. This has led different investigators to emphasize different aspects of emotion and to develop measurement techniques that spring from each of these approaches. As we will see, these range from self-report, diary-keeping and questionnaires, through coding of facial expressions, to the intricacies of psychophysiological and neurophysiological measurement.

Psychologists have also developed quite distinct descriptive languages, depending on their perspective. To speak of the feelings of anger is quite

different from describing its typical facial expression, or its characteristic physiological changes.

A particular problem comes from the existence of a strong folk psychology of emotion. Because we are used to observing emotion and thinking about it in everyday life, over time, cultures and subcultures have developed their own language for communicating about emotion. The language used in the scientific study of emotion is simply another of these.

There are important differences between a measurement-based science and an everyday folk psychology. The layperson might argue that if something as complex as emotion is studied through scientific methods, then much of its richness is lost. On the other hand, the psychologist/scientist would argue that if something cannot be studied using the methods of science then it will not be possible to say anything useful about it. In

practice, it is possible both to measure emotion and to make firm science-based statements about it. However, emotion as understood in everyday terms and as portrayed in fiction offers insights that should not be ignored.

The fundamental problem in the study of emotion concerns the links between subjectivity and objectivity. In everyday life, feeling, or the subjective side of emotion, is central. How can I get inside you to understand your feelings? If I could, would this let me understand your emotions?

Feelings matter because they are one of the aspects of emotion we must live with, although of course we also have to live with the consequences of our emotional expressions. However, for experimental psychologists who are concerned with the scientific status of their discipline, feelings are too subjective for comfort. To ignore them entirely (as happened through much of twentieth century psychology) is surely to miss the point though.

FIVE PERSPECTIVES ON EMOTION

Imagine that it is late at night and you are alone in the house. There is a sudden scream, a great crash against the front door, and then silence. What would you feel?

Or think of tripping over in the street, stretching out your hands to save yourself, and having them skid along in a mound of dog excrement. How would you react?

Or imagine that you have just completed a 5,000-word essay. It is your best work, but your tutor says, 'I'm sorry, but it was due in an hour ago. I cannot accept it.'

Emotions colour and enrich our lives, and help to energize us so that we can deal with whatever comes our way. They are adaptive and basic to human existence.

In spite of its fundamental importance to life, emotion is hard to define because it can be viewed from five distinct but nevertheless interrelated perspectives.

1. In the everyday sense, it is the subjective experience of emotion that seems to be most important to us. You feel happy and I feel sad, you feel angry and I feel embarrassed. Subjectively, these experiences give emotion its urgency, an urgency that can range from pleasant to unpleasant, from exciting to debilitating. Of course, feeling extends beyond emotion: as well as feeling happy, disgusted or ashamed, we can also feel pain, sick, ill, an ache. Nevertheless, it is the feeling aspect of emotion that seems to be so significant in everyday life.
2. Emotion has its *behavioural* aspects. An angry conversation takes a different course from a calm conversation. If you were extremely anxious in an examination, you would perform differently than if you were only mildly anxious. You can see emotional behaviour in the facial expressions of other people. You also know that not only does a smile feel different from a frown, but it also has different social consequences. In other words, emotion prepares us for action; it has an 'action readiness' associated with it that frequently translates into behaviour.

3. *Physiological* changes are involved in emotion. Narrowly escape a road accident and you can feel your heart beating faster and your muscles trembling. You can feel your face blush as you tip too far back and fall off your chair in class.
4. Emotion involves *cognition*, thought and emotion being intertwined. We perceive things and appraise their value to us – and it is this value that is thought to generate the emotion. This is a significant (perhaps even a necessary) forerunner to our emotional reactions. Whether or not emotion and cognition are necessary to each other, they are certainly strongly linked. Spend a moment or two thinking of a close friend and then thinking of a close competitor and compare the emotional reactions that begin to occur.
5. Emotion occurs in a context that is usually *social*, although it is possible to experience emotion when alone. Emotion tends to have a social communication function even when its biological significance is paramount, as with certain types of fear.



Figure 6.1

An angry conversation will take a different course from a calm conversation.

Emotion is a combination of all these functions, although the balance between them varies from time to time. If any one of them is left out, the richness of emotion decreases. Together they define emotion, and emotion defines the colour of our lives. Any definition of emotion must therefore be intricate. Kleinginna and Kleinginna (1981) reviewed many definitions of emotion and integrated them into the following:

Emotion is a complex set of interactions among subjective and objective factors, mediated by neural/hormonal systems, which can (a) give rise to affective experiences such as feelings of arousal, pleasure/displeasure; (b) generate cognitive processes such as emotionally relevant perceptual effects, appraisals, labeling processes; (c) activate widespread physiological adjustments to the arousing conditions; and (d) lead to behaviour, that is often, but not always, expressive, goal-directed, and adaptive.

The five perspectives on emotion described above have given rise to five approaches to its investigation. There is not an exact mapping, but, as will become clear, each of these approaches embraces particular types of measurement, empirical research and theory (see table 6.1).

EMOTION AS FEELING

Imagine that you are sitting at the dinner table on a visit to your family. You bear them no ill will but did not really want to make the visit, having other things you would have preferred to do. The conversation ebbs and flows in much the usual way as your parents start talking to your younger brothers about their clothes and their school grades. You eat quietly, letting the conversation lap around you, but it is impossible to remain indifferent.

You feel little bursts of empathy and sympathy for your brothers, remembering what you had to go through at their age. You feel old naggings of resentment. You look at your parents and feel sad at their lack of change as they become older. You worry about the work that you have to do and keep feeling needles of concern about a relationship that might be going wrong. None of this shows on your face as you calmly eat your meal.

How might different schools of psychological thought seek to appraise this scenario? Well, phenomenological psychologists, for example, emphasize the study of consciousness and subjective experience, and argue that psychologists should study what people experience, here and now, at this moment, in their present state. This is very much a holistic view, considering the whole, integrated person. Phenomenologists such as Giorgi (1970) argue that the foremost study of human beings should involve their consciousness. Of course, there are then considerable difficulties of measurement in the material of interest. How is it possible to work out what Rodin's *Thinker* might be feeling (see figure 6.2)?

The questionnaire as an assessment method

Recently, the experiential aspects of emotion have been investigated in a series of diary studies. These either involve keeping emotion diaries (Oatley & Duncan, 1992) or analysing previously published diaries (Haviland & Goldston, 1992). But the main way of assessing emotional experience is by reports, often in response to a questionnaire.

What are you feeling? Are you feeling angry? What did you feel like when she said that? In this type of test, the problem comes not with questions of this sort but with the answers. Are the respondents saying what they think we want to hear? Are they trying to project a particular image of themselves? Are they accurate, or do they lie? Do people actually know the answers?

Table 6.1 Summary of the major emphases and an example of research for the five major approaches to the study of emotion.

<i>Basic approach</i>	<i>Emphasis</i>	<i>Example of research</i>
Biological	– On the brain structures, neural pathways, and physiological underpinnings of emotions.	e.g. Examining the relationship between experimental lesions to certain areas of the brain and emotions (with animals), as well as studying emotions in previously brain-damaged humans.
Cognitive	– On understanding how an individual's goals and their interpretations or appraisals of a situation or event influence the way they feel.	e.g. Asking people to describe or to rate the importance of the particular thoughts (appraisals) associated with emotional experiences.
Phenomenological	– On describing and understanding the emotional experiences and feelings of the individual.	e.g. Conducting an interview asking the person a number of open-ended questions about the experience, emotions, the situation and so on.
Behavioural	– On how emotions are reflected in behaviour, and on how reinforcement histories influence emotional responding.	e.g. Studying how new stimuli or events acquire emotional value, or how emotions are related to instrumental behaviours.
Social	– On understanding how emotions, particularly emotional expression and recognition, are influenced by the individual's culture, learned 'rules', and the situation.	e.g. Studying how emotions are expressed in different situations, and how they depend on gender and the relationship between people in different cultures.



Figure 6.2

Rodin's *The Thinker*.

Are they able to distinguish between feeling, say, angry or afraid or jealous?

In spite of these difficulties, this method of assessment has led to a consideration of the importance of commonsense or folk theories of emotion. We all hold implicit psychological theories, constructed from everyday, commonsense observations and thoughts. For example, we might well believe that it is important to express emotion, because if it is bottled up it will eventually break out in ways that could cause discomfort or even be injurious to health. The study of such 'lay' theories and how they map onto theories of academic or professional psychologists has become important in its own right (see Fletcher, 1995).

Some interesting findings

A strong argument in favour of assessing emotional experience by questionnaire has been put forward by Scherer, Wallbott and Summerfield (1986) in a book entitled *Experiencing Emotion*. They focused on four of the basic universal emotions – joy, sadness, fear and anger – and asked participants to describe significant episodes involving these emotions that they had experienced during the previous few weeks. Being particularly interested in cultural differences in the experience of these emotions, Scherer et al. conducted a large-scale cross-cultural study throughout Europe (Belgium, France, Great Britain, Italy, Spain, Switzerland and West Germany) and Israel.

The research was concerned with:

1. the antecedent situation (e.g. what types of situation elicit different emotions? what are the important social settings?);
2. differentiated actions (e.g. are different behaviour patterns reported for different emotions? do the various response patterns differ in importance?);
3. person specificity (e.g. are there differences in the experience of emotion due to age, gender, social and occupational background?); and
4. social regulation and control (e.g. are different amounts of regulation or control reported with respect to the different emotions? are there individual differences in control?).

As an illustration of the investigators' analysis, they found clear differences in the duration of the experienced emotions. Fear appears to last from a few seconds to about an hour, anger between a few minutes and a few hours, joy from an hour to a day, and sadness from a day to many days. Although there were some cultural differences in the emotional experiences, the similarities across cultures were more marked.

Scherer and colleagues have, then, gone at least some way towards the psychologist's impossible ideal of experiencing another person's emotions and finding a method for describing them objectively.

EMOTION AS BEHAVIOUR

Those who take a behavioural perspective on emotion view it as something that we do rather than something that we feel. Hull and Skinner, for example, adopted three main approaches when tackling emotion (although these had petered out by the 1970s).

1. Emotionality The open-field test was used to study *emotionality* in rats. Levels of emotionality, reflected in changes in defecation and urination, increase when rats are placed in a large, brightly lit space. This is perhaps an evolutionary precursor to the reactions of many people to strange environments. Within a few generations, rats can be bred to be either less or more emotional in this situation, showing that emotionality is at least partly under genetic control.

emotionality the extent to which we react emotionally – akin to a personality trait, and thought to be partly inherited.

Emotionality was also studied by observing the *perseverative* effects of noxious stimuli. Typically, rats were given an electric shock prior to their normal time of eating, drinking or pressing of a lever to obtain food. The perseverative emotional effects of shock were increased food and water intake but the suppression of instrumental behaviour such as lever-pressing. In more detail, the effects depended on the quality of the food and the duration of the shock. The intake of food adulterated with quinine was lowered even further, whereas the intake of food enhanced by sucrose was actually elevated. On the other hand, prolonged durations of prior shock always led to the suppression of intake.

2. The frustration effect Think of how you feel and what you do if you put money into a vending machine, press the button or pull the drawer, and nothing happens. Amsel (1958, 1962) trained rats to run down an alley to food in a goal box and, from there, along a second alley to a second goal box. When the first goal box was left empty, the rats ran faster along the second alley.

frustration effect an increase in the vigour of responding, following the absence of reward, in a place where reward was experienced previously

This increase in vigour is known as the *frustration effect*. It is reasonable to regard an increase in behavioural vigour following the frustration of experiencing non-reward,

where reward was previously experienced, as an indirect measure of emotion.

3. Conditioned emotional response Again using laboratory animals, the procedures that demonstrate conditioned emotional response involve a mixture of classical and instrumental conditioning (see chapter 4).

Picture a rat in a Skinner box pressing a bar for food reinforcement. Sometimes a light comes on and is followed by an unavoidable electric shock. The rat soon learns to associate light and shock. When the light is on, it will decrease its rate of bar-pressing. After the shock, it will increase it again. This effect is sometimes known as conditioned anxiety and sometimes as conditioned suppression.

Much of everyday life appears to be characterized by this type of mixture of instrumental and classical conditioning. Unconditioned stimuli are frequently emotional and influence other behaviour. Millenson (1967) used these ideas to suggest a three-part behavioural model of emotion, in which all emotions are seen as deriving from various intensities and combinations of anxiety, elation and anger. As we have seen, a neutral stimulus that leads to a negative unconditioned stimulus leads in turn to anxiety. Moreover, a neutral stimulus that leads to an unconditioned positive stimulus (say, free food to a hungry rat) leads to elation, and a neutral stimulus that leads to the removal of an unconditioned positive stimulus results in anger. Variations in intensity and duration of the stimuli and the links between them are thought in the terms of this model to lead to variations in the intensity of these types of emotion.

Action readiness

The behavioural view of emotion is clearly limited and does insufficient justice to its richness. It has provided some useful behavioural information but over time has given way to the physiological and cognitive approaches.

A relatively recent and promising consideration of the behavioural aspects of emotion comes from Frijda (1996; Mesquite & Frijda, 1994), who proposes that the behaviour in emotion comes from action readiness, or tendency. Frijda emphasizes potential behaviour rather than the behaviour itself. The central notion here is that emotion carries with it a readiness to behave in a general way, rather than necessarily being associated with particular

behaviours. So, for example, fear might produce a tendency to run away or to hide, but there could be very many ways of running away or hiding. Also, as Frijda sees it, an action tendency might be suppressed or hidden behind some other behaviour, for social reasons. So we might feel like running away or hiding, but we do not because of the risk of looking foolish or cowardly.

Clearly Frijda's approach to emotion-behaviour links is very different from earlier ones. It is more subtle, more realistic and of more obvious relevance to human emotion.

EMOTION AS AROUSAL

The physiological changes associated with emotion are very familiar to us. It is hard to imagine even the mildest emotional experience without its attendant *arousal*.

arousal the fluctuating state of physiological activation of the nervous system

When we are happy or sad, afraid or angry, jealous or disgusted, the changes in our bodies are obvious. We might experience 'butterflies in the stomach', 'a sinking feeling', or 'our heart in our mouth'. We feel ourselves blush, feel our heart race as we narrowly miss an accident, and feel the drooping depletion in our body that accompanies sadness or depression.

We are more aware of the peripheral nervous system than we are of the central nervous system (CNS). We can feel our skin sweating or our muscles tensing, whereas most of us cannot feel our hypothalamus sending out signals, even though we might become aware of the result. We cannot feel our brain doing its work, emotional or otherwise.

How do we learn to recognize the bodily changes that accompany our emotional states? Do they differ, depending on the emotion we are experiencing? Can there be emotion without physiological change?

Variation in patterns of arousal

Emotion is about coping with sudden changes in our environment, changes that have significance for our survival (physical or social). So the autonomic nervous system (ANS) prepares the body for action and helps it back to quiescence later. These are what we refer to when we talk about changes in arousal.

Over the years, psychologists have proposed that the various emotions experienced in everyday life have their own specific *response patterns*, in terms of arousal. So, fear should have a different pattern from anger, which in its turn should be different from sadness and happiness, and so on.

response patterns particular patterns of physiological responses, in this case linked to various emotions

These suppositions were endorsed by the much-quoted study of Wolf and Wolff (1947). These researchers investigated a man who had had a gastric fistula inserted (a pipe directly into the stomach) for medical reasons. Wolf and Wolff (1947) found clear and consistent gastric differences between anxiety and anger. But

further evidence demonstrating differential physiological response patterns for different emotions was scarce for many years.

Lacey and Lacey (1970) found some evidence for emotion specificity in the cardio-vascular system, but it was not until 1990 that Levenson, Ekman and Friesen offered clear support for emotional response patterning. By instructing people on which facial muscles to use, they asked them to hold various emotional expressions for ten seconds. They found that happiness, surprise and disgust (or, at least, the facial expressions associated with these emotions) are characterized by a different heart rate than anger, fear and sadness, for example. Moreover, skin temperature is found to be lower in fear than in anger.

Theories of emotion

The physiological arousal aspect of emotion has been responsible for many theoretical developments. The James–Lange theory of emotion has probably been referred to more than any other. It began with William James (1884) but was also propounded by Carl Lange (1885) and stressed the importance of physiological mechanisms in the perception of emotion. It is the following quotation from James (1884) that is most frequently cited: ‘the bodily changes follow directly the perception of the existing fact, and . . . our feeling of the same changes as they occur is the emotion’ (1884, p. 189).

This theory drew attention to bodily changes occurring in response to environmental events, and suggested that emotion is our feeling of the bodily changes that follow perception. This reverses the commonsense idea that we perceive something that causes the emotional experience, which, in turn, causes the bodily changes. As shown in figure 6.3, the primary processing of environmental information occurs from the sensory receptor to the cerebral cortex, after which information is relayed back and forth between the cerebral cortex and the viscera (internal organs) and musculature. According to the James–Lange framework, it is the interpretation of these bodily changes that represents the perception of emotion.

The first and most vociferous opposition to the James–Lange theory came from Walter Cannon (1915, 1927, 1931, 1932) in

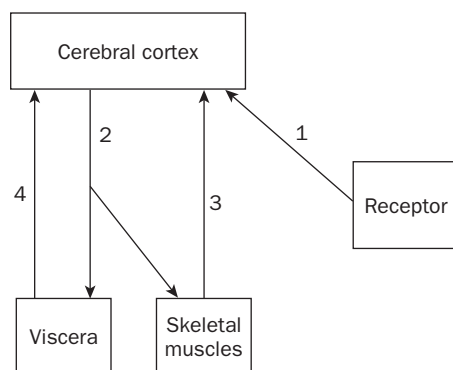


Figure 6.3

The James–Lange theory. Source: Strongman (1996).

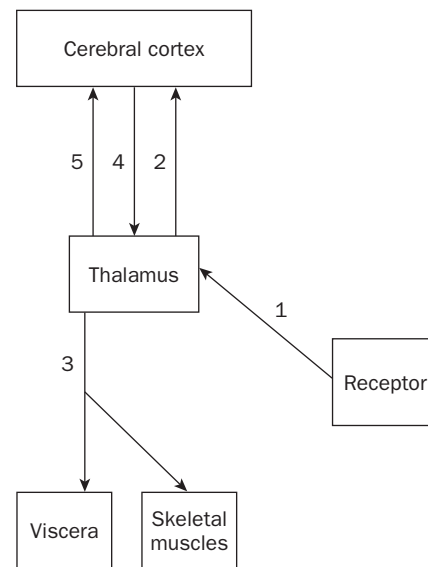


Figure 6.4

The Cannon–Bard theory. Source: Strongman (1996).

what has come to be known as the Cannon–Bard theory of emotion. Cannon emphasized the physiological foundations of emotion, including the CNS, and particularly the thalamus (see figure 6.4). According to the Cannon–Bard framework, environmental information is first relayed from the sensory receptor to the thalamus, after which it is sent to the cerebral cortex and to the internal organs and skeletal muscles, and then back and forth between the cerebral cortex and thalamus. Note that there is no direct communication in this framework between the cerebral cortex and the viscera or muscles.

Cannon also put forward some cogent criticisms of James’ theory. The most important were that:

1. internal organs react too slowly to be a good source of information about emotional feelings;
2. a drug, whilst it might induce sympathetic arousal in the nervous system, does not in itself produce emotion (see our discussion of Maranon, later); and
3. bodily arousal patterns do not differ much from one emotion to the next.

This third point was certainly prophetic of the later lack of empirical success in finding clear, dissociable bodily response patterns in emotion.

Nevertheless, the psychophysiological analysis of peripheral mechanisms in emotion makes it abundantly clear that arousal is an integral part of emotion. It also seems that the various emotions might have some characteristic patterns of psychophysiological reactions associated with them. It is therefore possible that, as measurement techniques become more advanced in the future, patterns of psychophysiological responses might be found for the various emotions. But the current belief is that for any

subtle emotional differentiation, cognitive mechanisms underlying emotion need to be directly addressed (see below).

The lie detector

The history of the lie detector is a practical reflection of the lack of firm ground in the psychophysiology of emotion.

Determining whether someone is being truthful is important in all walks of life. Historically, the methods used have ranged from torture through interrogation to interview. At one time, suspected witches were ducked under water for some time. If they drowned, they were innocent. If they did not drown, they must be witches and so were put to death anyway. There was no way out of this test (what these days we may refer to as a 'Catch 22') – but the obvious way to deal with slightly less extreme methods is to tell people what you think they want to hear (that is, to lie but in such a way that it 'beats' the test).

The rationale behind the lie detector, or polygraph (figure 6.5), is that the act of lying causes measurable psychophysiological changes in emotional arousal. The polygraph measures such responses as heart rate, blood pressure, respiration and the electrical conductivity of the skin (which changes with variations in sweating). Measures are taken from the person when relaxed and again when a mixture of critical and non-critical questions are put: 'When did you last hold a gun?' versus 'When did you last hold a party?' for example. Similar questions might be asked of an 'innocent' person and patterns of response compared.

Our psychophysiological responses are thought to give us away but, in practice, polygraph methods of lie detection are not reliable. Merely being asked about a gun might cause changes in psychophysiological measures, and, furthermore, it is very unlikely that there is a particular response pattern for lying (e.g. Lykken, 1984; Saxe, 1991).

If a foolproof way to detect lying is ever devised, enormous ethical dilemmas will arise. Imagine taking a lie detector test

at a job interview and then being told that you would not be employed because you had cheated once at school. Imagine parents giving such tests to their children. (For a discussion of deception more generally, see Ekman 1985.)

The limbic system

By now it should be clear that emotions have biological and evolutionary bases and involve both the CNS and the ANS. Although subcortical brain mechanisms are implicated in emotion – from the brain stem to the hypothalamus, thalamus and amygdala – cortical structures play an executive role. Animals with their cortex removed but with intact hypothalamus and thalamus show violent (sham) rage (Dusser de Barenne, 1920). Sham rage is so called because a weak stimulus can cause a release of autonomic responses (such as sweating and increasing blood pressure) that are normally only elicited by strong stimuli, and the anger is not directed at any one particular entity. Electrical stimulation of the hypothalamus can also produce such rage. Subcortical structures alone, however, do not provide the physiological mediation of emotion. This is provided by the limbic system of the cortex, with its extensive connections to the subcortex. See chapter 3.

The long history of research in these regions includes work by MacLean (1954, 1957, 1970, 1993). This work suggests that the limbic system, throughout its evolution, has helped to refine the emotional feelings that influence self-preservation. More recently, Panksepp (1981, 1989, 1991, 1992, 1993) made a very significant theoretical contribution to the physiology of emotion. He agrees that emotion is centred in the limbic system and has provided evidence for four, or possibly five, hard-wired emotion-mediating circuits. Panksepp is certain about the emotions of i) expectancy, ii) fear, iii) rage and iv) panic, although his evidence is not quite as convincing for the fifth, ludic (play) system.

Interestingly, Panksepp's approach is not solely neurophysiological but also considers the subjective or experiential. So, not only are there structural similarities between mammalian limbic systems across species, but Panksepp further uses subjective experience as a guide for distinguishing between those human brain states of emotion that appear also to be differentiated neurophysiologically.

Simultaneously, Le Doux (1999) demonstrated convincingly that much of the CNS work in relation to emotion is performed by the amygdala. Le Doux argues that the amygdala acts as an 'emotional computer', analysing any incoming information for its significance. In right-handed people, the right side of the brain, with which the amygdala has more extensive connections, is more associated with emotion than the left side. Le Doux argues that the connections between the amygdala and the thalamus may be especially relevant in the perception of emotion. In left-handed people, it is likely that the converse holds – i.e. that there are left hemisphere–amygdala connections.

It should be apparent from the discussion presented above that the physiological investigation of emotion has added much to our current knowledge. We now turn to a consideration of the complementary cognitive perspective.



Figure 6.5

The polygraph is used for lie detection.

THE COGNITIVE APPROACH TO EMOTION

In recent years, research into emotion and cognition has positively exploded, coming to dominate the field, although it remains a controversial approach to the psychology of emotion (see, for example, Power & Dalgleish, 1997).

Linking arousal and cognition

Schachter (1964, 1970) put forward a two-factor theory that had a profound influence on the way that psychologists think about emotion. Briefly, he argued that a necessary part of emotion is arousal of the sympathetic nervous system. The intensity of such arousal differs from situation to situation, and, according to Schachter, is interpreted according to our beliefs and/or knowledge about the situation. This means that our experience of emotion depends on two factors – physiological arousal and cognition.

Schachter derived three empirical predictions from his theory, which he tested in a cunningly devised experiment (Schachter & Singer, 1962). This work, conducted over 40 years ago, has provided the impetus for research on the relationship between emotion and cognition that continues up to the present day.

Schachter's work was partly based on a study by Maranon (1924), who had injected 120 patients with epinephrine (adrenaline) and asked them to say what it made them feel like. Adrenaline causes changes in sympathetic arousal reflected in rises in heart rate and blood pressure, respiration and blood sugar. Subjectively, this takes the form of palpitations, tremors, flushing, faster breathing, and so on. About 70 per cent of Maranon's patients reported only physical effects while the other 30 per cent also mentioned emotional effects. Typically, participants in the latter group said that the injection made them feel 'as if' they were afraid, rather than actually feeling afraid.

Schachter (1959) believed that an epinephrine injection would produce a state of arousal that people would evaluate in terms of whatever they perceived around them, if they were unaware of the effects to expect from the injection. He made three propositions that, between them, show the necessity of both cognition and arousal to emotion:

1. If we are in a physiologically aroused state for which there is no obvious explanation, then we will label it by using whatever cognitions are available to us. The same state might be labelled in many different ways.
2. If we are in a physiologically aroused state for which the explanation is obvious, then we will not seek further explanations.
3. For emotion to occur, there must be physiological arousal.

To test these propositions, Schachter and Singer (1962) persuaded participants to agree to an injection of a 'vitamin' so that its effects on vision could be determined. In fact, they were injected either with epinephrine or a placebo (saline). For ethical reasons, participants would nowadays be debriefed after the completion of such a study concerning the misinformation they had received. Participants were then given one of three 'explanations' of the

effects of the injection. Epinephrine-informed participants were told that the 'vitamin' might have side effects lasting for about 20 minutes. The effects described to them were the actual effects of epinephrine. Epinephrine-ignorant participants were told that the injections would have no side effects. Epinephrine-misinformed participants were told to expect impossible side effects, such as numb feet, body itches and headaches. There was also a control group, injected with saline, which had the same instructions as the epinephrine-ignorant group.

Following the injection, individual participants were taken to wait in a room with another person whom they believed was another participant, although it was, in fact, a confederate of the experimenters. For some participants, the room was a mess and the confederate was friendly and extraverted ('euphoric' condition). The remaining participants and the confederate were in a different room (the 'anger' condition), and they had personal and somewhat insulting questionnaires to complete. The confederate became steadily more angry with this and eventually stormed out ('anger' condition). Participants were observed through one-way mirrors and were given self-report questionnaires afterwards, the major questions concerning how angry or irritated, or how good or happy, they felt.

In the euphoric condition, the epinephrine-misinformed or epinephrine-ignorant participants rated themselves as being significantly more euphoric than the epinephrine-informed participants. The placebo control participants were less euphoric than either the misinformed or ignorant groups, but more euphoric than the informed group, although these differences were not significant. The epinephrine-misinformed and epinephrine-ignorant participants had no good explanation for their bodily state. Similarly, in the anger condition, epinephrine-ignorant participants were significantly angrier than the epinephrine informed, with no differences between controls and the misinformed or ignorant groups. (See figure 6.6 for a summary of the experiment.)

In this ingenious experiment, Schachter and Singer were convinced that they had supported Schachter's three propositions by manipulating cognition and arousal. Schachter's (1970) general conclusions were that there is little physiological differentiation between the emotions, the labelling of emotional states being largely a cognitive matter.

Even though both Schachter's ideas and his studies have been influential, they have also been criticized (see Cotton, 1981; Izard, 1972; Leventhal, 1974; Plutchik & Ax, 1967; Reisenzein, 1983). To take one example, Schachter did not prove that emotion depends on physiological arousal and cognition. It may be possible to induce physiological arousal through cognition, or to produce a sort of physiological tranquillization cognitively. For example, it is possible to speed up or slow down heart rate and respiration simply by imagining playing a vigorous sport or by visualizing a tranquil scene.

Leventhal (1974) goes further, arguing that Schachter has never shown exactly how arousal and cognition combine in emotion, particularly in children. From a Schachterian perspective, how would a young child be able to feel any emotion before knowing the linguistic label for that feeling?

In the end, although Schachter's ideas have not been disproved, neither have they stood up robustly to criticism. At

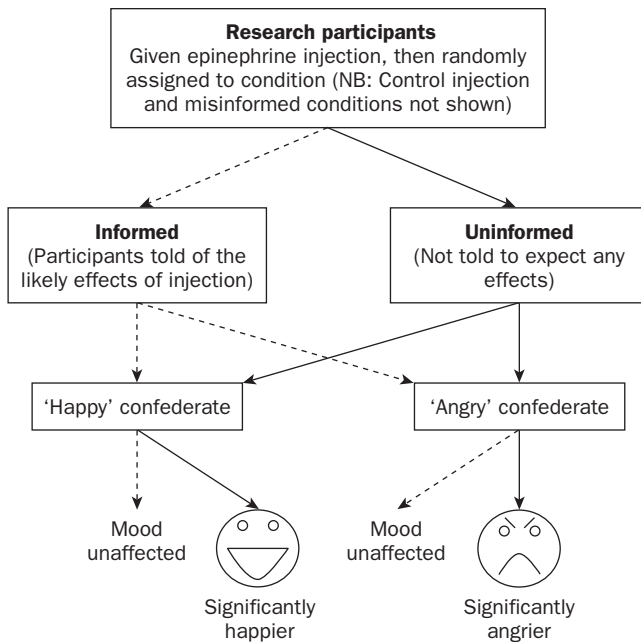


Figure 6.6

Diagram showing a simplified version of the experiment by Schachter and Singer (1962). The dotted lines trace the manipulation and consequences for the 'informed' participants, while the solid lines trace those for the 'uninformed' participants.

Pioneer

Stanley Schachter (1922–97), an innovator in the 1960s, more than anyone else succeeded in introducing significant ideas emanating from the 'cognitive revolution' into the area of emotion. His influence has continued to the present day, especially regarding the reciprocal influence of emotion and cognition, and the particular significance of attribution. His ingenious study with Singer began many years of exploration into the relationship between physiological arousal and cognitions (especially appraisals) in the psychology of emotion. His general conclusions were that there is little physiological differentiation between different emotions, the labelling of emotional states being largely a cognitive matter. These conclusions have been vigorously challenged but his influence in the field remains.

present, it is reasonable to conclude that feedback from physiological arousal can directly intensify emotional states. Moreover, the arousal–emotion link is mediated, or at least affected, by causal attributions, or appraisals (see chapter 17), about the source of the arousal. Whether both physiological arousal and cognition are necessary for the perception of emotion remains an open question.

The role of appraisal

Do we think before we experience an emotion, or do we experience the emotion and then reflect on it cognitively, or both?

Compare these two situations:

1. You are sitting in the waiting room of a specialist, waiting for the results of some tests done to track down the cause of chest pains that have been bothering you. The receptionist comes over to you and apologizes that the doctor has been held up but asks you to wait because he would definitely like to see you.
2. You are crossing the street, lost in thought, when there is the sudden loud blare of a horn, the screech of locked wheels and the hiss of air brakes. You jump for your life and stand trembling as a truck rumbles past, the driver angrily shouting through the window.

These two situations both involve cognition and emotion, but in very different ways.

Appraisal is the foundation stone on which the emotion–cognition structure is built. Theorists maintain that our evaluation – or appraisal – of the personal significance of an event leads to an emotional reaction. Such appraisals allow us to make fine distinctions between our emotional experiences and help us to determine the extent or intensity of the emotion. For example, being criticized privately is a very different experience from a public condemnation, and the appraisal leads to a less intense emotional reaction (be it anxiety or anger). Attention was first drawn to the significance of appraisal for emotion by Arnold (1960) and continued most strongly by Lazarus (1993), although its importance is assumed by many theorists who link emotion and cognition.

Ellsworth (1991; Smith & Ellsworth 1985) lists six dimensions of appraisal:

1. attention
2. pleasantness
3. certainty
4. anticipated effort
5. human agency
6. situational control

Each appraisal is considered to be unique, making each emotional experience unique, and the degree to which appraisals are similar determines the similarity between emotions.

The relationship between emotion and cognition

The question that remains is whether cognition, and in particular cognitive appraisal, is necessary for the perception of emotion. If someone lacks the cognitive capacity to make a particular appraisal of an event, can they experience the emotion that is normally associated with that event?

coping processes ways of dealing with stressors – usually a mixture of being problem-focused and emotion-focused

Lazarus (e.g. 1982, 1984, 1991, 1993) has added greatly to our understanding of emotion and *coping processes*. He believes that an event must

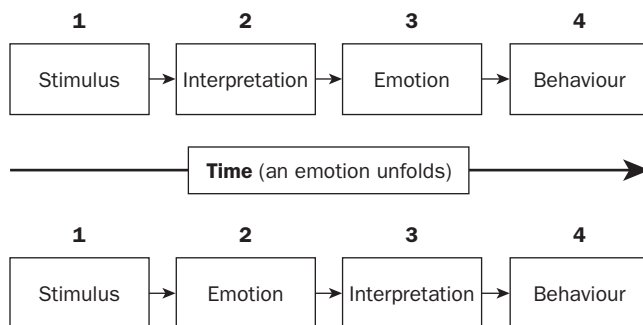
be understood before emotion can follow. On the other hand, Zajonc (e.g. 1980, 1984) argues that cognition and emotion are independent, with emotion even preceding cognition in some cases.

This debate about whether cognition necessarily precedes or follows emotion turns on the definition of cognition (see Buck, 1991; Ellsworth, 1991). It is clear that conscious thought is not involved in some rapid emotional reactions. A sudden screech of brakes tends to produce an unthinking, uncontrolled emotional reaction. But it can also be argued that some appraisals might also occur unconsciously and immediately. If such appraisals are cognitions, then all emotion is preceded by and involves cognition. The alternative is that some emotions involve cognition and others do not. Figure 6.7 shows two of the possible temporal relationships in emotion.

Perhaps this is an arid debate. In everyday life the interplay between emotion and cognition is very intricate. There is a huge difference between the internal lurch you would feel at a sudden loud noise in the middle of the night and the combination of thoughts and feelings you would experience if this turned out to be the precursor to your house going up in flames. In other words, a simple, immediate reflex action that might send a burst of adrenaline through the system is very different from the complexities of emotional reaction when the cortex is involved and specific hopes, fears, memories and expectations are implicated. The reflex system is primitive and very much centred on the 'now', whereas what might be termed 'real' emotion also involves the past and the future (through appraisals).

It is clear that emotions can – or, as Lazarus would argue, must – result from appraisal. It is also clear that emotional states can

1. Sequencing in the commonsense theory



2. Sequencing in the affective-primacy theory

Figure 6.7

The temporal relationships between aspects of an emotion. The most common sequencing of the elements (the commonsense theory) is shown at the top, while an alternative view is presented below. Source: Ellsworth (1991).

affect thoughts and even subsequent emotions. You have judged that your partner has been unfaithful to you (appraisal) and this makes you react jealously (emotion). But when you are jealous (emotion) this may in turn stop you thinking (cognition) as clearly as you normally would, and you may become anxious (emotion) about that.

THE SOCIAL APPROACH TO EMOTION

The fifth way of approaching emotion concerns its mainly social nature. This highlights the importance of emotional expression as well as personal characteristics, such as gender, that may be related to differences in emotional expression.

Are emotional expressions universal? How do we recognise emotions in other people? How do we express emotion?

Body language – nonverbal expression of emotion

Although we can experience emotion when alone, emotion is mainly a social occurrence. Emotional expressions communicate a great deal, and we rely on recognising them in others to assist in the smooth running of our social interactions.

Body language is central to emotional communication, which is essentially nonverbal. While we communicate about the world verbally, there is a nonverbal subtext that relates to the interplay of our emotions. The interpretation of the emotional meaning of body language is a skill that we seem to acquire and use unconsciously, even automatically. Some people are better at it than others, just as some people are more openly expressive of their emotions than others. Our ability to suppress and moderate our emotional expression further complicates matters.

body language expressions, gestures, movements, postures and paralinguistic aspects of speech that form the basis of nonverbal communication

To find out more about emotional expression, we first have to decide whether to study it in everyday settings or in the laboratory. Both have their difficulties – the context of ordinary life is complicated by a multitude of influences, while the laboratory is essentially an artificial environment with respect to normal social interaction.

Methods used in the laboratory to study the accuracy of emotional expression include photographs of real or posed expressions, actors, schematic drawings, emotional readings of the alphabet, and electronic filtering of voices (leaving only the manner rather than the content). For example, actors may be asked to express a range of emotions, with photographs of these expressions being shown to volunteers to determine if they can be recognized correctly. Or emotion-laden conversations may be recorded and then the actual words used filtered out electronically, with volunteers then being asked if they can recognize any emotions being expressed in the resultant sounds.

Back in the 1970s, Ekman, Friesen and Ellsworth (1972) demonstrated that most people are able to judge emotional expressions



Figure 6.8

Body language is central to emotional communication.

reasonably accurately. In other words, we can correctly recognize the emotion being expressed on another person's face. One way of studying this is to ask participants to identify the emotions portrayed in photographs posed by actors.

Many of these expressions are universal, to the extent that they are present in all the cultures studied. Emotional expressions are also recognisable across cultures, including pre-literate cultures untouched by Western influence (see figure 6.8). Izard (e.g. 1980) argues that there are ten basic emotions that are interpreted similarly across cultures, each with its own innate neural programme (that is, a programme defining how the nervous system is wired up, present from birth; see chapter 3):

1. interest/excitement
2. joy
3. surprise/startle
4. distress/anguish

Pioneer

Carroll Izard (1923–), with his differential emotions theory, has been the main proponent of the study of individual, distinct emotions since the 1970s. He has stressed the importance of studying emotion from a developmental perspective. In *Differential Emotions Theory*, he suggests that emotions are motivational and organize perception, cognition and behaviour, helping us to adapt and cope with the environment, and to be creative. Arguing that there are several discrete emotions, Izard has proposed that the emotional system is independent of any other, although linked closely with motivation and personality, and that they develop together from the early years.

Pioneer

Paul Ekman (1934–) has been the acknowledged expert on the expression and recognition of emotion from the early 1960s to the present. Among important research issues that he has investigated over his long and influential career, he has drawn attention to the importance of non-verbal behaviour, context, deception and many other aspects of emotional expression, particularly in the face. The findings of his work have generated considerable discussion of the possible universality of facial expression. Deriving from his research findings, his theory of emotion is based on three central assumptions: 1) emotion has evolved to deal with the fundamental tasks of life, 2) to be adaptive in evolutionary terms, each emotion must have a distinct facial pattern, 3) for each emotion, a distinctive pattern exists between expression of that emotion and the physiological mechanisms associated with it, and this is linked to appraisal of the emotion.

5. disgust
6. contempt
7. anger/rage
8. shame/humiliation
9. fear/terror
10. guilt

The possible universality of the facial expression of emotion and its recognition is another central debate in the study of emotion (see articles by Ekman, 1994, and Russell, 1994, for opposing views). In general, although there is a very widespread agreement across cultures, it is difficult to make a completely compelling generalization from this type of research. Without investigations into all cultures, universality cannot be finally concluded. There are also cultural and subcultural rules governing the display of emotional expression. Fear might be expressed in a similar way universally, but its expression might be more suppressed in some cultures than others. And in Western cultures, anger is usually more openly expressed by men than by women.

Ekman (e.g. 1982, 1992) bases his theory of emotion on three assumptions:

1. Emotion has evolved to deal with the fundamental tasks of life.
2. To be adaptive in evolutionary terms, each emotion must have a distinct facial pattern.
3. For each emotion, a distinctive pattern exists between expression of that emotion and the physiological mechanisms associated with it, and this is linked to appraisal of the emotion.

Some of Ekman's more fascinating work concerns what happens when we attempt to hide or suppress an emotion. Ekman

and Friesen (e.g. 1969) suggest that feelings ‘leak out’ nonverbally. Although we might successfully suppress our facial expression, our social anxiety might be expressed through movements of our hands and arms, and even our legs and feet. Ekman (1985) developed this research with respect to deception in general, mentioned earlier in this chapter in the context of lie detection.

facial feedback hypothesis the view that our experience of emotion is determined by physiological feedback from facial expressions

The expressive aspect of emotion has generated the *facial feedback hypothesis* (e.g. Tomkins, 1962). This suggests that the experience of emotion is intensified by the proprioceptive feedback we receive from its facial expression. So if you fix a smile or a frown on your face for some minutes, you should begin to feel happier or more irritable, respectively. Try holding a pen sideways between your front teeth for a few moments, a technique used by Strack, Martin and Stepper (1988), and you might begin to experience feedback effects, such as you might experience if you were feeling happy and in good humour. Now compare holding the pen between your lips (see figure 6.9).

This provides an interesting link with the James–Lange theory – perhaps it is possible that we become irritable *because* we frown or happy *because* we smile?

Gender

Are Western women irrational and emotional, and Western men logical and non-emotional?

Brody and Hall (1993) showed that women are generally more emotionally expressive than men. They are also better at expressing sadness and fear, whereas men have the edge on them with anger.

Yet such gender differences are probably more dependent on cultural than genetic factors. In Western society, girls are usually brought up to be more emotionally accountable to society than boys, and also to be responsible for their own emotional lives and for the emotional lives of those around them. Relatively speaking, boys are often encouraged to deny their emotions.

Whether these differences are currently changing in Western society is an open question. See Shields (2002) for a recent thorough exploration of the relationship between gender and emotion.



Figure 6.9

Facial configurations from the facial feedback experiment by Strack, Martin and Stepper (1988).

Research close-up 1

Sociocultural influences on emotion

The research issue

In *The Expression of the Emotions in Man and Animals*, Charles Darwin (1872) argued that the facial expressions of humans are innate, that they are therefore the same in all cultures around the world, and that they are modified from the emotional expressions of non-human animals.

Today, psychologists still believe that emotions, especially facial expressions of emotion, have strong heritable factors. For example, children who are blind at birth and have never observed the smile or frown on another person's face nevertheless smile or frown in the same way as children with intact vision.

Darwin's argument is further supported by more recent cross-cultural research indicating that there is evidence for universal emotional expressions across cultures.

Design and procedure

Ekman, Friesen and colleagues (Ekman, Friesen & Ellsworth, 1972) asked people from around the globe, including the United States, Estonia, Germany, Turkey, Brazil and Japan, to indicate which emotions were being expressed in a series of photographs. The universal similarity of people's judgements was highly informative.

Ekman and Friesen also showed similar pictures of facial expressions to people in an isolated tribe in Papua New Guinea called the South Fore who had little contact with the outside world.

Results and implications

The South Fore people matched the pictures with specific emotions, and their judgements were similar to those of people from other parts of the world (see figure 6.10). This represents further evidence indicating that expressions are innate and not learned from other sources such as the media or society. However, more recent research has shown that accuracy in emotional judgement is higher when emotions are both expressed and recognized by members of the same national, ethnic, or regional group, suggesting that some cultural learning of emotion does take place.

Ekman, P., Friesen, W.V., & Ellsworth, P., 1972, *Emotion in the Human Face*, New York and Oxford: Pergamon Press.



Figure 6.10

On the top is a Western woman. On the bottom is a Taiwanese woman. Notice the similarity in their expressions of 'disgust' and 'happiness'.

SPECIFIC EMOTIONS

So far we have considered emotion in general terms, but there have also been many attempts to study specific emotions (see figure 6.11).

Izard (e.g. 1977, 1993) is one psychologist who has discussed specific emotions in detail. He argues that there are discrete

emotions, a view that makes good everyday sense. In *Differential Emotions Theory*, he suggests that emotions are motivational and organize perception, cognition and behaviour, helping us to adapt and cope with the environment, and to be creative. Like many other theorists, Izard links emotion with personality, believing that they develop together from the early years.

Everyday Psychology

Gender influences

The stereotype about the female being more emotional than the male is a powerful and pervasive image in most cultures. However, researchers have found that females and males are often more similar in the manner they experience emotion than this stereotype would lead us to believe.

For example, males and females often show the same facial expressions and adopt similar language and descriptions when they talk about their life experiences. For these aspects of emotional expression, there are no substantial differences between the two genders. But in everyday life males seem to engage in these activities less spontaneously than females.

There are also certain typical beliefs about how emotions should be displayed, which differ across gender. For example, men appear more likely to show anger towards strangers when they feel challenged, and more likely to transform their anger into aggressive action than are women.

We often use stereotypical beliefs about emotion to distinguish between what is 'masculine' and 'feminine', and to offer explanations and attributions for our behaviour. For example, we might say, 'I must be sensitive, like all women,' or 'I must be tough; after all I'm a man.'

Emotional differences between females and males are also more likely to occur in contexts that highlight different social roles and relationships. For example, it seems that females are more likely to express fear and sadness, especially when communicating with their friends and family, and this may be further exaggerated when they are talking to other females. And they are more likely than males to give accounts of emotion that include interpersonal relationships.

Fischer, A.H. (ed.), 1999, *Gender and Emotion: Social Psychological Perspectives*, Cambridge: Cambridge University Press.



Figure 6.11

The many faces of emotion.

FIVE FUNDAMENTAL EMOTIONS

Of the five fundamental discrete emotions, four are generally judged to be ‘negative’ – fear/anxiety, anger, sadness and disgust – and one to be ‘positive’ – happiness. Although there is only one positive emotion, the negative emotions are not always experienced as negative. In fact, the distinction between positive and negative emotions may not be altogether appropriate, as we shall see.

Anxiety will be discussed later in this chapter when we consider abnormalities in emotion. Fear is directed towards specific objects or events; it alerts us to danger and prompts us to escape or avoid.

Anger, on the other hand, is quite different. In a perceptive analysis of anger, Averill (1982) argues that it is an emotion about conflict, and is inevitably linked to aggression. However, even though aggression might be biologically determined, Averill sees anger as largely socially constructed, aimed at correcting perceived wrongs and upholding standards of conduct. As such, the experience of anger is not necessarily negative.

The third specific emotion, sadness, has a directness that makes it seem a little less negative than some of the other negative emotions. It is usually a reaction to loss that slows us down into discouragement, downheartedness and loneliness. Grief is an extreme and very complex form of sadness and always involves the loss of something, or more usually, someone, of great importance to us. Izard (e.g. 1991) describes grief as including sadness, anger, disgust, contempt, fear, guilt and shyness, and shock, protest, despair and reorganisation.

The last of the negative emotions, disgust, is very primitive. Its central concern is with the rapid expulsion from the body of any substance that might be toxic, noxious or harmful to it.

Happiness, joy, elation, and so on, seem to be variations on a theme. In recent years, there has been an increasing emphasis on the study of ‘positive psychology’ (embracing constructs such as happiness) in contrast to the study of what might be termed ‘negative psychology’ (see, for example, chapter 14 and the work that has been conducted at the Positive Psychology Center, University of Pennsylvania, by Martin Seligman and colleagues: www.positivepsychology.org). However, Averill and More (1993) argue that happiness is difficult to understand because it can take on so many different meanings.

OTHER DISCRETE EMOTIONS

There are, of course, many other discrete emotions. Jealousy and envy are sometimes confused with one another in everyday conversation, but are quite easily distinguished. We become jealous if we think that we might lose someone’s affections (usually those of a sexual partner) because a third person is involved. On the other hand, we envy someone who has something (a possession, a quality, etc.) that we would like. It makes little sense to be jealous of a friend’s car.

There is also a class of self-conscious emotions – embarrassment, pride, shyness, shame and guilt. They all make reference in

some way to the self, particularly the self in a social context. Most emotions are social, but the self-conscious emotions are distinctive insofar as they depend on other people’s opinions. Lewis (1993) describes shame, for example, as involving an evaluation of our actions in relation to our entire self (our character), following a transgression of standards, rules or goals. It is always very negative and painful, and disrupts both thought and behaviour. Shame is concerned with a fundamental failure of the self, a character flaw, and we have a very strong motivation to avoid or escape it.

THE DEVELOPMENT OF EMOTION

Are we born with our emotions or do we learn them? What happens as we turn from the emotional excesses of childhood to the more inhibited world of the adult? How important are early relationships to emotional development?

EARLY THEORIES

While individual differences in temperament seem to be there from birth, emotion, cognition and social behaviour appear to develop together and to be dependent on one another. However, some aspects of emotion must be built in or hard-wired.

Studies by Watson and Raynor (1920) and Bridges (1932) dominated the early investigation of emotion development. From a behavioural perspective, Watson and Raynor were interested in emotional development through conditioning and studied the conditioned fear of rats in a boy of 11 months (see chapters 1 and 4).

Watson argued that our emotional lives build up around this type of conditioning, although he argued that the foundations for this are provided by what he saw as the three basic built-in emotions. Watson called them X, Y and Z, although they could be named fear, rage and joy. His observations of infants suggested that these reactions are elicited by, respectively, a sudden loss of support, a thwarting or hampering of physical movement, and a stroking or tickling of the body.

Bridges’ (1932) approach to emotional development was based on observation rather than experiment. She believed that we have only one built-in emotional state – undifferentiated excitement. By about the age of three months, Bridges argued that this divides into positive (delight) and negative (distress). There follows increasing differentiation of the emotions, until, by about the age of two, we show a primitive form of all of the adult emotions. With respect to this proposed differentiation, Bridges argued that at about six months comes anger, then disgust, and then fear, and at 18 months or so jealousy breaks away from anger. As for positive emotions, it is proposed that elation develops at about seven or eight months, joy at about 20 months, affection for adults at about nine months, and affection for children at about 15 months.

For many years, Bridges’ descriptions could be found in most psychological texts, even though it could be argued that her

observations were very sketchy, her definitions inexact, and she had not dealt adequately with emotion in newborn infants.

RECENT THEORIES

Following these early beginnings, the study of emotional development was relatively quiescent until the 1980s, when new theories and more sophisticated empirical research began to appear. For example, Harris (e.g. 1989) carried out a series of studies on how children understand emotion, often using stories and asking children to make judgements about the characters' emotions. Among other results, he found that children of about six cannot imagine people having an emotion without their expressing it, but by the age of ten children understand hidden feelings in others.

A clear theory of emotional development was developed by Izard and Malatesta (1987; Magai [formerly Malatesta] & McFadden, 1995). They suggest that emotion is a system that relates to life-support, and to behavioural and cognitive systems, but develops independently of them. They view emotions as generating much of the motivational force behind behaviour. Izard and Malatesta express their theory with formal postulates about the neurochemistry of emotion, and the expression and experience of emotion. Although they believe (like Bridges) that emotions become differentially associated with internal states very early in life, Magai and Hunziger (1993) suggest that individual emotional development hinges on life's crises and transitions, such as puberty, marriage or retirement. However, they argue that everything begins with attachment (see below), and if an emotion overwhelms at age 17, it might still overwhelm at 77, despite the process of individual emotional development. In other words, although we might learn to express our emotions in different ways throughout our lifespan, the *experience* of the emotions remains constant. Moreover, some of the most compelling emotional experiences that many people have are concerned with their social attachments (romantic or otherwise).

Lewis is another major theorist of emotional development (e.g. 1992, 1993). He regards emotional development as dependent on maturation, socialisation and cognitive development, through gradual differentiation of emotional states. Lewis argues that we

have to be self-aware to truly experience emotion. So before the infant has developed self-awareness, according to Lewis it could have an emotion but would not properly experience it.

Like Bridges and Malatesta/Magai, Lewis believes that most emotions have appeared by about the age of three. Lewis argues that distress, interest and pleasure are there from birth. Joy, sadness and disgust, then anger, appear from three to six months, followed by surprise and fear. In the second half-year of life, with self-awareness developing, Lewis argues that the self-conscious emotions of embarrassment, empathy and envy appear. Finally, Lewis states that the self-conscious evaluative emotions of pride, shame and guilt appear. These emotions depend on seeing the self as both subject and object, requiring a theory of mind – the understanding that other people have minds and hence separate viewpoints (see chapter 9). In the end, for Lewis, the cornerstones of emotional development are cognition and socialization.

From the two theories that we have reviewed above, it should be possible to ask what actually develops during emotional development. The answer takes us back to the five perspectives on emotion described earlier in this chapter. So we develop (a) emotional experience, (b) emotional behaviour and (c) physiological reactions. We also learn to express and recognize emotion in various social situations, depending on personal maturation and cognitive development (see figure 6.12).

ATTACHMENT

A core part of early emotional development is *attachment* – the initial emotional bond that forms between an infant and caregiver. According to many theories, this forms the basis of both social and emotional development of the individual.

attachment the close links formed between a human infant and caregiver, or the intimate bond that can form between adults

The seminal work on attachment was carried out by Bowlby (e.g. 1973, 1980; see also Ainsworth, 1989, and Bretherton, 1985), who described two major types of attachment pattern – the secure, and the insecure. Insecure attachment is further divided into two types – one defined by avoidance of the attachment

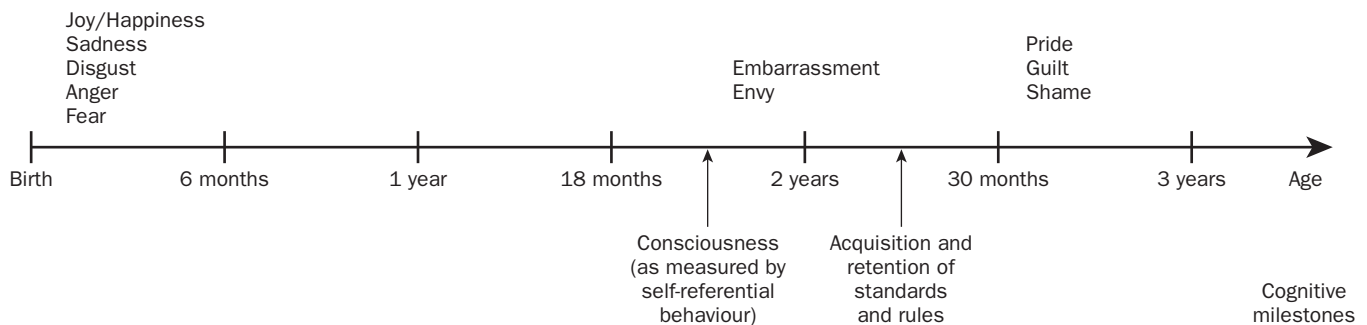


Figure 6.12

Child development and the appearance of discrete emotions. Source: Adapted from Lewis (1993).

figure (avoidant) and the other by anxiety and ambivalent feelings towards the attachment figure (anxious-ambivalent).

In drawing attention to attachment, Bowlby placed great emphasis on the emotional relationship between the child and the caregiver during the first two years of life. His basic idea was that a warm continuous relationship with a caregiver leads to psychological health and well-being throughout life. So the nature of the emotional bond of the initial social attachment has implications not only for future intimate relationships but also for potential psychopathology.

Bowlby (e.g. 1980) argued that the child's relationship with the caregiver prompts the development of internal working models. These give the child a schema of how accessible and responsive a caregiver is and how deserving of care the child is. These models will then affect future relationships. A secure working model will prompt expectations of good relationships and an open positive manner. By contrast, an insecure working model may lead to expectations of poor, unsupportive relationships and a distrustful, hostile manner. Of course, these differences in style will bring about obvious outcomes – what we might call self-fulfilling prophecies.

The enormous amount of research linking initial attachment to later development has been reviewed by Thompson (1999). He concludes that the relationship between early attachment and later relationships (including love relationships) is not straightforward. Rather than becoming fixed at an early age and then unchanged, it is mediated by a continuing harmonious parent-child relationship and depends on the nature of other short-term relationships too. Internal working models of how people relate might be established on the basis of the initial attachment, but can be changed by later social experiences and even by psychotherapy.

Thompson summarises the effects of early attachment to caregivers as providing children with answers to four questions:

1. What do other people do when I express negative emotion?
2. What happens when I explore?
3. What can I accomplish?
4. How do I maintain good relationships with others?

A great deal of research on attachment in children and adults documents its importance from both developmental and clinical perspectives. For a full coverage, see Cassidy and Shaver (1999).

It should by now be clear that, although early processes (such as attachment to the primary caregiver during infancy) are important, emotion goes on developing throughout the life-span. Indeed, some of the more fulfilling emotional experiences occur later on in life. For a review of this topic, see Strongman and Overton (1999).

EMOTIONAL INTELLIGENCE

emotional intelligence the capacity to be sensitive to and regulate our own emotional state, and that of other people

Finally, the study of *emotional intelligence* and regulation is rapidly becoming an important area within emotional development research, highlighting the link between emotion and cognition.

Emotional intelligence refers to a set of skills that we use to deal with emotion-relevant information. Salovey, Hsee and Mayer (1993) suggest that it is concerned with:

1. the appraisal and expression of emotion;
2. the use of information based on emotion; and
3. the adaptive nature of emotion regulation.

Of particular importance is how we learn to regulate our own emotions.

Salovey and colleagues argue that emotional self-regulation depends on two factors. The first is how disposed we are to regulate our own emotions. This in turn depends on emotional awareness and our thoughts about our own moods. Secondly, it depends on strategies that can be used to affect our own feelings. For example, we might manipulate what we feel by spending a day helping other people, or perhaps by completing the less pleasant tasks of the day early on, saving the more pleasant things for later. Thompson (1990, 1991) links changes in emotional self-regulation to the development of cognitive skills, allowing emotion to be seen as analysable and capable of change. No doubt, such capacities themselves depend on a mixture of genetic influences and the development of language and social behaviour.

As emotional intelligence and the ability to self-regulate develop, so does a child's own way of thinking about emotion. This, in turn, will be influenced by socialization. So emotional intelligence and self-regulation may to some extent depend on the attachment style the child experiences and how well socialized she becomes. Emotional intelligence is, of course, also concerned with accurately interpreting and dealing with others' emotions.

CAN EMOTIONS MALFUNCTION?

As our emotional life develops, can it go wrong? Is it possible to be too happy or too sad or too angry? Is it useful to face life with a moderate degree of anxiety?

Emotion is always normal. It can be extreme or unusual, but it is always providing information for whoever is experiencing it. It might be seen as inappropriate by other people, but for those who are experiencing the emotion, it is simply their experience. They might be able to limit its expression on the outside but unable to influence directly their own personal emotional reaction. Emotion is functional, both in the immediate sense of providing information, and in the true evolutionary sense of being adaptive (otherwise it would not have been preserved by natural selection). However, emotions have also been seen as contributing to most forms of mental illness, leading Oatley and Jenkins (1992) to ask: how can emotions malfunction?

PSYCHOSOMATIC DISORDERS AND PANIC ATTACKS

In psychosomatic disorders, there are links between emotion, cognition, and physical symptoms (including pain). Examples

where such links have been established are asthma, peptic ulcers, hypertension and skin rashes, where psychosomatic conditions may exacerbate the condition even if they do not cause them *per se*. These disorders are usually mediated via organs or organ systems that are innervated by the autonomic nervous system (ANS).

Furthermore, many physical illnesses are now thought to have a psychological, more particularly an emotional, component (e.g. Robinson & Pennebaker, 1991). Pennebaker (e.g. 1990) has also reported some fascinating research showing that communicating (by talking or writing) about our illnesses and negative emotional experiences may help to ameliorate them.

Anxiety is thought to be at the root of many psychosomatic disorders. It is one of the most common emotions, and certainly contributes to many types of illness, physical or mental. At one level, it is a commonplace experience and has had more theories offered to account for it than most other emotions (see McNaughton, 1996; Strongman, 1996). On another level, there is extreme anxiety.

Imagine this. You suddenly start to tremble, shake and feel dizzy. Your heart is speeding up and slowing down uncontrollably and you have pains in your chest. You feel overwhelmingly hot and break out in a sweat and then you start to shiver with the cold. Your hands and feet start to tingle. You seem to be losing touch with reality and worry that you are having a heart attack or a breakdown. This is a *panic attack* – the extreme form of acute anxiety – and it is most unpleasant and disturbing.

panic attack sudden and apparently inexplicable experience of terror characterized by extreme physiological reactions, such as heart palpitations and feelings of impending doom

Any of us might have a panic attack under severe circumstances. We might ride it out and put it down to external factors that we are able to tackle. It then becomes an experience to look back on. But if we begin to worry about having more panic attacks, then we might be developing a panic disorder. This might lead us to start avoiding social situations that we believe might bring on an attack. We are then becoming agoraphobic.

THEORIES OF NEUROTIC ANXIETY

Freud (1975a, 1975b) had two theories of neurotic anxiety, both suggesting that it is made up of an unpleasant feeling, a discharge process, and a perception of whatever is involved with this discharge. Freud believed that anxiety develops through the trauma of birth, the loss of the caregiver, early uncontrollable threats or

impulses, and, more specifically, fears of castration. In contrast to Freud's theoretical framework, subsequent work (e.g. Bowlby 1973) has stressed the importance of separation from early attachments.

For learning theorists (e.g. Mowrer, 1953), anxiety is a form of learned fear, particularly when the source of the fear is vague or repressed. Anxiety becomes a conditioned response that can then participate in new learning. Taking this a stage further, H. Eysenck (e.g. 1957) suggests that we inherit proneness to neurotic anxiety through the ANS, or learn it as conditioned fear. In searching for the physiological mechanisms that might underlie these processes, Gray (1982, 1987) states that the septal-hippocampal region of the brain mediates anxiety. This brain system functions to inhibit behaviour that is a threat to the organism.

Some recent theories of anxiety stress cognition. For example, M. Eysenck (1988) shows that those who are high or low in anxiety also differ in their cognition. So someone with a high trait anxiety (anxiety as a personality characteristic) is likely to have more worries stored in long-term memory than someone with low trait anxiety, and these worries will be much more easily accessed.

One of the most telling contributions in this area comes from Barlow (e.g. 1991), who places anxiety and depression at the centre of emotional disorder. He argues that it is difficult to distinguish between anxiety and depression. However, whilst most depressed patients are also anxious, not all anxious patients are depressed.

Barlow suggests that emotional disorders occur when chronic states of dysthymia (i.e. lowered mood) interact with briefer episodes of panic and depression. This might lead a depressed patient to misinterpret a personal or environmental event as a sign of personal inadequacy, which simply makes matters worse. Barlow's general argument is that stress, anxiety and dysthymia can interact with everyday emotions of excitement, anger, fear and sadness. When this happens, the result is one of four kinds of emotional disorder – mania, outburst of temper, panic or depression. For fully fledged emotional disorders to occur, these emotions have to be experienced unexpectedly or inappropriately, and to be seemingly out of control.

Finally, it is worth repeating that emotions can never be abnormal. Their expression or recognition may be awry, they might become too extreme for comfort, or they might contribute to mental illness, but even in these unfortunate circumstances, emotions always provide us with useful information. In the case of abnormalities, this is information that something is wrong and needs fixing.

Research close-up 2

Writing for health

The research issue

The work of James Pennebaker during the 1990s (1990; Pennebaker & Seagal, 1999) has greatly influenced our view of the role of emotion in the therapeutic process.

The aim of Pennebaker's research was to study the impact of writing about emotional experiences on a person's physical and mental health. This can be seen as a natural extension of the therapeutic process, but in a much simplified and potentially useful form.

Design and procedure

Pennebaker's procedure, as described for example in Pennebaker & Seagal (1999), involved assigning participants randomly to groups. These groups are asked to write about particular topics for between 15 and 30 minutes each day for three to five days. The writing is done in a laboratory and no feedback is given.

The experimental groups are asked to concentrate on a significant emotional issue in their lives and to explore their deepest feelings about it. They can link the issue to their closest relatives and friends, to their own characters and personalities. They can follow the same topic on each day or begin new topics. They are told that the quality of their writing will not matter and that what they write will be kept completely confidential. Control groups are asked to write about topics such as how they spend their time, what they do in the evenings, and so on.

It is interesting to note that in the experimental groups the wide variety of participants – of all ages and from all walks of life – disclose an equally wide range of traumatic experiences quite readily. Some become quite upset when they are writing, but most report it to be a very valuable experience.

Results and implications

The outcome of written emotional disclosure (in comparison with controls) is typically as follows:

- significant decreases in visits to physicians in healthy people;
- positive effects on the immune system;
- long-term improvements in mood and reductions in distress;
- improvements in grades for students; and
- fewer absences from work for university staff.

Such effects generalize across settings and cultures and are independent of feedback. Furthermore, no obvious individual or personality differences were found.

However, there are some considerations to bear in mind, as follows:

- Writing and talking about trauma both have a greater effect than writing about more superficial matters.
- Choice of topic can influence outcome: e.g. emotional issues versus traumatic experiences.
- Distributed writing seems to be more effective than concentrated writing.

Writing about trauma and emotion might have beneficial effects on mental and physical health because it helps to reduce the stress that comes from inhibition. However, Pennebaker's work shows that language usage is more important than the release of inhibition that comes from mere disclosure. So the more often people use positive emotional words in their writing, the greater the beneficial effects on their health. Also, high and low levels of negative emotional words link to poorer health outcomes, and medium levels link to better outcomes. Finally, improved health is linked to an increase in the number of causal words (e.g. 'because', 'reason') and insight words (e.g. 'understand', 'realize') used.

The major implication of this fascinating work is that the simple disclosure of an emotional problem may have an enormous therapeutic value, even before any other therapeutic work is done. Pennebaker (1999) asks the crucial question – can writing supplement or substitute for medical or psychological treatment?

Pennebaker, J.W., & Seagal, J.D., 1999, 'Forming a story: The health benefits of narrative', *Journal of Clinical Psychology*, 55, 1243–54.

FINAL THOUGHTS

The complexities of emotion are fundamental to human functioning. The subjective experience of emotion is so crucial to people's everyday lives that it should remain of importance to the psychologist despite the methodological compromises that have to be made when it is studied.

Although emotion has been researched and theorized about from every perspective psychology has to offer, some themes and issues stand out. For example, how far are emotions built in or biologically determined? To what extent are they constructed from our socio-cultural background? At present, our best guess is a mixture of the two. Particular emotions, or perhaps basic dimensions of emotion, are seen as being built in biologically, with much of human emotional life being constructed on top of this from subtle and rich sociocultural influences. Moreover, a basic assumption made by most current theorists is that emotion is fundamentally adaptive, i.e. it is functional from an evolutionary viewpoint. Our emotional apparatus provides us with information that helps us to survive.

Although emotion has been studied from so many different perspectives, it is clear that no analysis of it should be made without some reference to cognition. Emotion and cognition are intertwined; together with physiological arousal, cognition might even be necessary to emotion. It also may be impossible to fully understand one without the other.

Even though emotion is largely a social phenomenon, it is usually regarded as something intrapsychic, something that is going on inside us. This 'first person' perspective is similar to that adopted by many people in the arts and humanities when writing about emotion, for example poets, songwriters and novelists. Psychologists have learned a great deal about emotion, from our experience of it, to our expression of it, and hence to our recognition of it in others. We know a lot about how emotion develops, and we are beginning to understand how we learn to regulate it. However, it should be noted that emotion is also studied by other social scientists, such as anthropologists and sociologists, who tend to see emotion not as something internal, but as a phenomenon that occurs 'out there', between people (see Strongman, 2003).

Emotion is essentially and perhaps primarily a matter of individual experience. Even though it is possible to gain useful folk psychological insights into this experience, it is the steady application of the research endeavours of psychological science that give us the most reliable information.

Summary

- Emotion colours our lives, but is difficult to define because there are at least five approaches to it, involving: feelings, behaviour, arousal (physiology), cognition and social context.
- Emotion is best understood systematically using the measurement techniques of psychological science.
- Feelings have been measured by (a) questionnaire and (b) analysis of diary entries.
- Emotional behaviour has been studied mainly in animals, with investigations of emotionality, the frustration effect and conditioned emotional responding.
- Physiological measures of emotion have been made in both the central and the peripheral nervous systems, but there has been little success in identifying distinctive patterns that correspond to discrete emotions.
- Emotion and cognition influence each other in complex ways. Appraisal, or the evaluation of the significance to us of any incoming stimuli, is particularly important.
- Emotion has communicative functions (largely nonverbal) that derive from its expression and recognition.
- Some psychologists stress the idea that specific emotions such as fear, anger, happiness and sadness should be studied as discrete entities.
- Some aspects of emotion are inherited, but emotion continues to develop throughout the lifespan. Of particular importance in the early years is attachment.
- In extreme forms, emotions can be involved in psychological disorders.

REVISION QUESTIONS

1. Discuss why emotions are central to our lives, and how they have been investigated by experimental psychologists. Which measurement techniques and research methodologies of psychological science can significantly inform the study of emotion?
2. How do emotion, cognition and appraisal interact?
3. What are the communicative functions of emotions, and how do these differ between specific emotions such as fear, anger, happiness and sadness?
4. Which aspects of emotion are inherited, which are acquired during childhood, and which aspects continue to develop throughout the lifespan?
5. How are emotions involved in psychological disorders? Why are feelings so difficult to study and measure?
6. Compare the links between cognition and emotion when a) someone is feeling sad over a friend's death and b) when they are feeling scared at a strange sound in the night.
7. Do you think that it is possible to experience emotion without physiological arousal being involved?
8. Do animals have emotions?
9. Is it possible to increase our emotional intelligence?
10. Can emotion ever be 'abnormal'?
11. Why do poets, novelists and song-writers as well as psychologists have a great deal to say about emotion?
12. For the most part, emotions seem to be useful to us, to be functional. In what way is jealousy useful?

FURTHER READING

Harré, R. (ed.) (1986). *The Social Construction of Emotions*. Cambridge: Cambridge University Press.
An illuminating collection of essays on various aspects of the social construction of emotion.

Lewis, M., & Haviland, J.M. (eds) (1993). *The Handbook of Emotions*. New York: Guilford Press.
An interesting collection of specialist state-of-the-art articles.

Magai, C., & McFadden, S.H. (eds) (1996). *Handbook of Emotion, Adult Development, and Aging*. New York: Plenum Press.
A collection of specially prepared articles on the course of emotion in later life.

Oatley, K., & Jenkins, J.M. (1996). *Understanding Emotions*. Cambridge, MA, and Oxford: Blackwell.
A nicely written, comprehensive coverage of emotion theory and empirical research.

Power, M.J., & Dalgleish, T. (1997). *Cognition and Emotion: From Order to Disorder*. Hove: Psychology Press/Lawrence Erlbaum and Associates.
Concerns the interplay between emotion and cognition in both normal and disordered emotion.

Strongman, K.T. (2003). *The Psychology of Emotion: From Everyday Life to Theory*. 5th edn. Chichester: John Wiley & Sons.
A popular undergraduate text that provides an overview of more than 150 theories of emotion.

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