

The Passions of the Soul

Early Emotion Theories

Western thinking about emotions has a long history. For the purpose of this book, this history is divided into three chapters. Because initial theoretical development was quite slow, the first chapter spans across many centuries, from antiquity to the inception of biological science and psychology in the 19th century. Across these centuries, emotion theory developed in tandem with political, religious, and technical change.

Although derived primarily on chance observation and philosophical musing, early emotion theory has shaped later emotion research and is still reflected in current thinking about emotions. It is thus relevant for Chapter 2, which details emotion theories of the 20th century leading up to today. In this epoch, the role of political and religious ideas became less prominent and was overshadowed by methodological advances that boosted experimental work including the study of the brain.

Chapter 3, the last chapter in this series, is dedicated to three schools of thought that developed out of traditional emotion theory and the new insights gained from the 20th-century experimental approach. These schools will be introduced and evaluated based on empirical evidence from psychology and neuroscience. They will form the theoretical basis for the remainder of this book.

ANCIENT GREECE AND THE EARLY ROMAN EMPIRE

Many aspects of Western civilization, including modern medical and psychological theories, have their roots in the flourishing cultural and intellectual climate of ancient Greece. After defeating Persian invasion at the beginning of the 5th century BC, Greece developed into a rich and influential political power, with Athens at its center. Its wealth enabled remarkable technical, artistic, and scientific advancements, and it generated a climate in which knowledge was highly esteemed. It was during this time that one of the first learning institutes, Plato's Academy, was founded and that thinkers started to document scientific

and philosophical progress. Although much of the original documentation is lost, Greek ideas about the human mind and emotions can be gleaned from a few surviving scripts and from the writing of following generations of thinkers.

From these documents it seems that the mind—also referred to as the **psyche**, or the soul—was a topic of vivid interest. The soul was held as a source of life separate from the body and responsible for humans' ability to feel, behave, and reason. Reason was perceived as humans' greatest gift and the means by which we can lead a life of virtue. As such, reason was of primary interest to the Greeks, and relatively little attention was paid to other aspects of the soul—including emotions. No treatise is known that specifically discusses emotions. Instead, propositions about emotions surface in the context of other topics and often are ambiguous and contradictory. They contradict across the writings of different authors, but also within the writings of a single author. Moreover, their direct meaning is often difficult to assess. Ancient Greek differs substantially from modern European languages, and many of the terms used by the ancient philosophers have no literal translation. Despite these challenges, however, modern historians and philosophers have formulated ideas about what the ancient Greeks thought about emotions—ideas that will be reviewed next.

The Classical Period

In general, emotions were not highly esteemed during the classical period. Greek society was what we would call today interdependent, with individuals having great concern for others and the orderly workings of their social group. As such, showing emotions was frowned upon and considered shameful and weak. This is evident from the art that originated during the classical period and that is characterized by a perfect human image whose bodily and facial expressions are seemingly affectless (Figure 1.1). It is also evident from the writings of three key figures in classical philosophy: Democritus, Plato, and Aristotle.

Democritus. Democritus lived around 460 to 370 BC and is today best known for his *átomos* theory, which holds that the things we see are made up of small, indivisible parts. He also believed that the soul was made up of these indivisible parts, called atoms, and like others at the time assumed that the soul is responsible for human intellect (Crivellato & Ribatti, 2007). His attitude toward emotions can be inferred from his notion that a pleasant life presupposes little “movement of the soul” and a satisfaction with one's own achievements (as cited by Kahn, 1985). This suggests that he viewed both too positive and too negative emotions as unsettling and therefore bad. This negative view toward emotions is even more evident from his statement that “wisdom frees the soul from emotions” (as cited by Sorabji, 2002), which implies that emotions are like a disease that needs curing. Apart from these propositions, however, we know little about what Democritus thought emotions are, how they are related to reason, and where they are located in the body.

Plato. Plato lived from 427 to 347 BC and was a younger contemporary of Democritus. Plato is credited with making **Socratic thinking** available to posterity. He documented his teacher

FIGURE 1.1 Venus de Milo

This ancient Greek sculpture was created between 130 and 100 BC. It is believed to depict the Greek goddess of love and beauty. It is currently on display at the Louvre Museum in Paris, France.

Source: © Mrakor—Fotolia.com.

Socrates in written dialogues, which illustrate the Socratic approach to insight (Hunt, 1994). Like Democritus, Plato assumed the soul to be a special entity, separate from the body (Crivellato & Ribatti, 2007). One part of this soul he called *logos* (Greek, “reason”) and argued that it was divine and immortal. Because *logos* enabled humans to think, it dominated other aspects of the soul and the body. Given its hierarchical position, Plato thought *logos* to be situated in the head. As a second part of the psyche, Plato named the *thymos* (Greek, “spirited”), situated in the chest and responsible for feelings or emotions (e.g., courage, rage). Because to Plato emotions had a better and a worse side, he thought *thymos* to comprise two divisions, with the better division being located closer to the head. As a third part of the soul, Plato named the *epithymētikon* (Greek, “desire”), which he thought was responsible for the body’s appetites. As it was the least “worthy” of the three parts, it was located near the liver, furthest away from

the head. Thus, like Democritus, Plato separated reason from emotion and elevated the former over the latter. Moreover, he made reason immortal and potentially independent from the body, while tying emotions to perishable internal organs whose action was known to change with extreme “movements of the soul.”

Aristotle. Aristotle lived from 384 to 322 BC and was a student of Plato (Figure 1.2). He joined him at the age of 18 at the Academy in Athens and remained there for about 20 years, after which he spent some time traveling and tutoring Alexander the Great (Hunt, 1994). Although a devoted student, Aristotle disagreed in many ways with his teacher Plato. For example, he not only relied on deductive reasoning like Plato, but included observation and investigation in his modes of inquiry. He therefore is conceived as the founder of modern empirical science. Aristotle also differed from Plato in his definition of the soul. This comprised a vegetative or nourishing part, present in plants and animals; a sensing and

motor part, present in animals only; and an intellectual part, present in humans only. Moreover, he held that, in humans, all parts are connected with or housed in the heart because the heart is what gives life to a body (Crivellato & Ribatti, 2007).

Although Aristotle never wrote a treatise on emotions that we know of, he mentioned them in several of his writings. In *On the Soul* he defined emotional events as “things on account of which people change and differ in regard to their judgments, and upon which attend pain and pleasure, for example anger, pity, fear, and all other such things and their opposites” (as cited by Konstan, 2006). He tied emotions to reason by assuming that emotions arise from our reflection of events. Moreover, he purported that the same event may trigger different emotions depending on how we think about it. Thus, he believed that only adult humans, but not children and animals, have emotions, as the latter were believed incapable of reason (Konstan, 2006). Finally, some reviewers of his work speculate that Aristotle viewed emotions as arising primarily from our interactions with other humans (Konstan, 2006; Nussbaum 2001). This is because he only mentioned them at length in his treatise *Rhetoric* (Greek, “oratorical”), where he outlined the art of persuasion and where all his emotion examples referred to human dialogue.

The Hellenistic Period

Toward the end of the classical period, political influence shifted from Athens to Macedonia, which became the new center from where Alexander the Great expanded Greek rule to Persia and beyond. The era after this change in power, the Hellenistic period, is marked by a diversification of philosophic schools. One of these schools, the **Stoic school**, further developed emotion theory. It reinforced the old idea that the mind should control emotions and subdue desires because gratifying them could cause a person harm.

FIGURE 1.2 Plato and Aristotle



Section of the fresco “School of Athens,” which Raffaello Sanzio created around 1509 for the Vatican in Rome, Italy. The section shows Plato on the left and Aristotle on the right.

Source: Wikimedia Commons.

Chrysippus (280–206 BC), one of the Stoics' more prominent thinkers, elaborated on the Aristotelian idea of emotions presupposing reason or judgment. He suggested that emotions consist of two judgments. The first one decides whether an event is good or bad, whereas the second one decides what can be done about it. The types of emotions produced by these judgments were classified based on their **valence** and their temporal relation to the event. Desire and fear were conceived as positive and negative emotions, respectively, and associated with a future event. Pleasure and pain were conceived as positive and negative emotions, respectively, and were associated with a present event (Brennan, 2007; Sorabji, 2002).

This emotion conceptualization differs greatly from present conceptualizations, where “desire” and “pain” would be excluded because they refer to a motivation and a sensation, respectively. Nevertheless, it was useful, as it represented a first attempt at organizing emotions on more than one continuum and thus facilitated later attempts at characterizing what is and is not an emotion. Another Stoic proposal that was revisited about 2,000 years later concerned the distinction between emotions and bodily changes. Here, the Stoics argued that emotions do not arise from bodily changes, but rather that emotions may eventually cause bodily changes (Sorabji, 2002).

The Roman Period

The last two centuries BC saw again a shift in power. The Romans gained influence and eventually took over the Macedonian Empire. Yet the only significant contribution to the development of emotion theory came again from a Greek mind, Galen. Galen was a Roman citizen of Greek ethnicity who lived from about 130 to 200 AD (Watson & Evans, 1991). He worked as a personal physician at the Roman court and is best known for his contributions to medicine. Yet he also was a philosopher and interested in matters of the mind. For example, he further developed Plato's division of emotions into those arising from insult and those arising from desire (Hunt, 1994). He also extended an ancient Greek theory that posited the existence of four basic bodily fluids, or **humors** (Latin root humor = fluid), the balance of which was critical for a person's physical and mental health. Galen extended these ideas by linking humors to a person's temperament, which he saw as one possible contributor to illness (Watson & Evans, 1991; Figure 1.3). Later, medical doctors would take Galen's theory further by assuming that a person with a dominance of blood was warm-hearted, a person with a dominance of black bile was melancholic, a person with a dominance of yellow bile was choleric, and a person with a dominance of phlegm was phlegmatic (Watson & Evans, 1991). Needless to say, these ideas were wrong, and they did a lot of damage to patients throughout history. Yet they established a link between a person's organic makeup and his or her emotional life, and thus advanced the notion that emotions have a biological basis.

Greek Ideas Still Reflected in Modern Thinking

When considering the contributions of ancient Greeks to our understanding of emotions, at least four principal ideas stand out. The first idea is that reason is separate from emotions. This divide remains with us to the present day, and researchers are just now beginning to challenge it. The second idea is that emotions presuppose reason, and here the

Greeks anticipated modern insights regarding the role of cognition. Third, the Greeks introduced emotions as faceted experiences that can take many shapes and forms and that can be categorized or organized along different dimensions. As such, they formulated the foundation for present emotion theories, which we discuss in Chapter 3. Finally, the Greeks held that emotions rest in the human body rather than in the brain. In subsequent centuries, this notion was empirically tested and at the same time permeated popular conceptions and language. For example, English idioms such as “breaking your heart” or “pouring your heart out” still bear the voice of Plato, Aristotle, and Galen. Will they have the last say? The answer is both yes and no. Yes, because the body clearly contributes to emotions, and we explore these contributions in later chapters. No, because we now know for certain that the brain contributes as well.

FIGURE 1.3 Galen and the Four Temperaments



Galen's theory remained popular for centuries to come. Illustrated here is its application to human physiognomy, by Johann Kaspar Lavater. The latter believed that the four temperaments find expression in different facial features. The etching is taken from Lavater's "Essai sur la physiognomonie destiné à faire connoître l'homme et à le faire aimer," published by Jacques Van Karnebeek at The Hague in 1781. Sanguine (top left), Phlegmatic (top right), Choleric (bottom left), and Melancholic (bottom right).

Source: Courtesy of Jean-Marie Bertin, La Meignanne, France.

THE RENAISSANCE AND POST-RENAISSANCE PERIOD

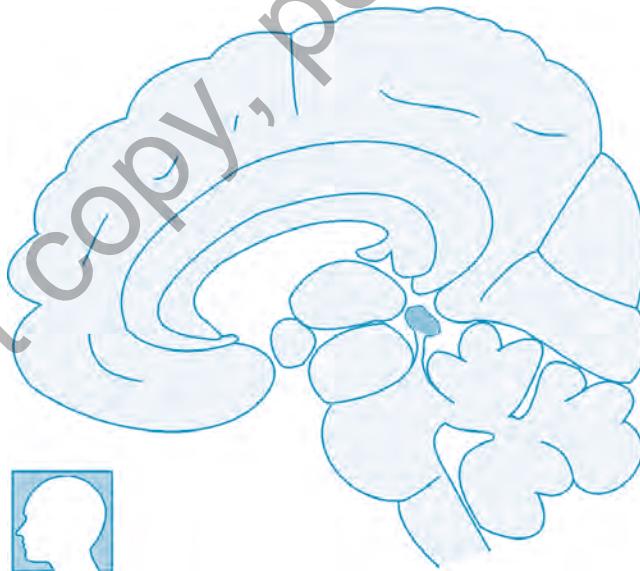
After the initial growth of interest in matters of the mind, there came a long period during which this interest was subdued. First, there was a change in Europe's political climate that dampened the Greeks' intellectual spirit. With the ascent of the Roman Empire, a lesser emphasis was placed on scientific advancement, and changes were introduced that specifically impeded medical and psychological discovery such as the prohibition of human dissection. Second, with the establishment of Christianity, philosophy and science were directed toward justifying and defending Christian ideology. Thus, deliberations on the soul

concerned primarily its spiritual nature rather than its functioning in the here and now or its relationship to biological matter. Only in the Renaissance, with the introduction of print and a revival of the arts and sciences, do we see fresh contributions to psychological and emotion theory.

These contributions came first and foremost from René Descartes (1596–1650), the famous French scientist and philosopher. Descartes benefited from a range of scientific and technological advances made before his time, since the beginning of the Renaissance in the 15th century. Like his predecessors, Descartes believed in a distinction between body and soul and assumed that the soul exists in a form that cannot be described by common physical laws. His assertions on the soul and the soul's relationship to emotions are elaborated in great detail in *The Passions of the Soul*, a treatise he published shortly before his death (Descartes, 1649/1989; A Closer Look 1.1).

As the soul could move the body, it needed a point of contact. Descartes assumed this contact to occur in the **pineal gland**, a small endocrine structure located in the middle of the brain (Figure 1.4). He reasoned that although we see with two eyes and hear with two ears, our sensory impressions are united in that they reflect only one rather than two sensory sources. Moreover, he speculated that the soul can behold only one thing at a time, and that therefore it would need to contact a part of the brain that is not dually represented.

FIGURE 1.4 Pineal Gland



A sagittal slice of a human brain illustrating the pineal gland in blue. The icon in the lower-left corner shows the position of this slice relative to an individual's head.

A CLOSER LOOK 1.1

Selected Quotes From *The Passions of the Soul*

On the value of Greek philosophy: "There is nothing more clearly evinces the learning which we receive from the ancients to be defective, than what they have written concerning the passions. For although it be a matter the understanding whereof has even been hunted after; and that it seems to be none of the hardest, because every one feeling them in himself, need not borrow foreign observations to discover their nature. Yet what the Ancients have taught concerning them, is so little, and for the most part so little credible that I cannot hope to draw nigh truth, but by keeping aloof off from those roads which they followed. Wherefore I shall here be forced to write in such a sort, as if I treated of a matter never before handled" (*The Passions of the Soul*, Article 1).

On the role of the soul in emotions: "Our passions also cannot be directly excited or taken away by the action of our will, but they may indirectly, by the representation of things which use[d] to be joined with the passions which we will have, and which are contrary to these we will reject. Thus, to excite in oneself boldness, and remove fear, it is not enough to have a will to do so, but reasons, objects and examples are to be considered of, that persuade the danger is not great, that there is ever more security in defense than flight, that there is glory and joy in vanquishing, whereas there is nothing to be expected but grief and dishonor in flying and the like" (*The Passions of the Soul*, Article 45).

On the differences between sensation and emotion: "[O]ne may distinguish two kinds of movements excited by the [animal] spirits on the [pineal] gland: the one [kind] represent to the soul the objects that move the senses . . . and do not have any effect on the will; the other [kind] does have some effect on the will, namely those that cause the passions or the movements of the body that accompany them" (*The Passions of the Soul*, Article 47).

On the generally positive nature of emotions: "And now we know them all [the emotions], we have less reason to fear them than we had before. For we see that naturally they are all good, and that we ought to avoid only the ill use of them, or their excesses, for which the remedies I have laid down may suffice, if every man were careful enough to practice them" (*The Passions of the Soul*, Article 211).

FIGURE 1.5 René Descartes



Source: © Georgios Kollidas—Fotolia.com.

As, apart from the pineal gland, all brain structures are more or less symmetrically represented in the two brain hemispheres, he inferred that the pineal gland—being a central, unreplicated structure—must be where the soul and the body meet.

Importantly, Descartes held that the soul was unnecessary to move the body. Some bodily actions such as breathing or walking could be performed without thinking about them and thus were likely the result of automatic, inbuilt mechanisms, which he attributed to the action of spirits—fluid-like substances that move through the body. These spirits were shared between humans and animals, whereas the soul was not.

In keeping with Greek tradition, Descartes tied emotions to the existence of a soul. However, rather than making emotions a direct part of the soul, he let them arise from the soul's contact with the body. Specifically, he defined them as “caused, fomented, and fortified by some motion of the spirits” (*The Passions of the Soul*, Article 27). To illustrate this, he suggested that we flee automatically from a predator simply through the sensation of an external threat, which activates the spirits. We only experience fear because our soul is sensitive to the body's mechanical action that was caused by the spirits. This action stirs the pineal gland and thereby moves the soul.

Although Descartes assumed that emotions are chiefly caused by external events and are passively experienced by the soul, he made room for instances in which the soul can moderate or create emotions. This, he argued, could be achieved if one were to differently evaluate the events that triggered one's current emotion or if one were to conjure memories of events that previously evoked the emotion one wishes to feel. For example, if you were sad and wanted to “will” your emotions to become more positive, you could reinterpret the event you thought was sad as one of opportunity for change, or you could think of previous events that made you happy. Thus, your will would have an impact on the spirits in your body whose action would be perceived as an emotional change by the pineal gland. To date, these two emotion-regulation mechanisms are referred to as reinterpretation and distraction, and are a lively area of research.

The emotions that Descartes recognized are divided into a set of primary emotions and a set of secondary emotions, which are variants of a single primary emotion or combinations of different primary or secondary emotions. In the primary set he included admiration, love, hatred, desire, joy, and sadness. Examples of secondary emotions are estimation, contempt, generosity, pride, humility, or dejection—all of which Descartes presumed to be related to the primary emotion of admiration. With the proposition of primary and secondary emotion states, Descartes foreshadowed what was to become our present conceptualization of basic emotions. Descartes also formulated the hypothesis that emotions have sensory precursors. Specifically, he held that pleasure and pain are precursors in the experience of joy and sadness. The presumed relationship between pain and sadness is particularly interesting, as it was proved correct by present-day neurophysiological and neuroimaging research.

Last, an important contribution of Descartes was that he improved the negative image emotions had since antiquity. Rather than viewing them as experiences that compromise rational thought and that therefore should be avoided, he assigned them a functional significance. With a surprisingly Darwinian spirit, he postulated that emotions “dispose the soul to will the things nature tells us are useful and to persist in that volition”

(*The Passions of the Soul*, Article 52). If we feel fear, it is likely because flight is a beneficial action in that circumstance. If we feel anger, it is likely because confrontation or fight is a beneficial action in that circumstance. Thus, emotions bias us to behave in a self-serving manner. Despite their having an obvious function, however, Descartes warns that excessive emotions may be bad for a person and suggests ways in which such excess may be prevented.

In sum, with his treatise *The Passions of the Soul*, Descartes introduced a range of ideas that shaped the thinking of both laypeople and scientists for several generations to come. First, he recognized both the body and the brain as being important for emotions. Moreover, he argued that the experience of emotions depends on a center in the brain. Although this center was anatomically misplaced, it pointed subsequent inquiries in the right direction. Second, unlike the ancient Greeks, who attributed emotions chiefly to cognitive reflection about external events, Descartes rightly recognized that many emotional responses are highly automatic and may occur in the absence of deliberate thought. Thus, he acknowledged the existence of both **bottom-up** and **top-down** emotional responses and introduced the idea of emotion regulation. Finally, he made an attempt at identifying basic emotion states and assigned these states a functionality. Unfortunately, he failed to recognize that such attributed functionality should hold for both human and nonhuman animals and that therefore both should have emotions. He also had some curious notions about the relationship of body and mind, which misdirected our thinking about emotions to the present day. He assumed the body to be nothing more than an **automaton**, a biological machine that in the case of nonhuman animals can function without the mind. The mind he assumed to be an immaterial substance that perceives and acts through the body. Although he connected body and mind through the brain, there still remained a sharp divide that discouraged the physical study of mental phenomena, such as emotions.

Although it is difficult to pinpoint the reasons for these misconceptions, one possibility is that they grew out of contemporary religious pressures (Descartes, 1649/1989). Descartes was aware of religious censorship, which banned many important works such as Copernicus's heliocentric theory and not infrequently led to arrests, as in the case of Galileo. Undoubtedly, Descartes was motivated to evade such treatment and may thus have aligned his philosophy with Christian doctrine.

(R)EVOLUTIONARY IDEAS OF THE 19TH CENTURY

After Descartes, there came a long period during which emotion theory more or less stagnated. New insights required a big shift in how people thought about themselves and their role on Earth. This shift depended on a range of developments in the 18th century. One of these developments was again a change in Europe's political structure introduced by the French Revolution and the downfall of the aristocracy. Another development was the industrial revolution, brought on by significant technological advances (e.g., the steam engine) that changed existing agricultural and manufacturing modes. Production now moved to a larger scale, leading to higher living standards and an increase in Europe's population. During this time, economic powers established themselves independently from

the Church and the nobility. This allowed the political climate to become more secular and enabled scientists to pursue their discoveries with less of a fear of religious censorship.

In the wake of this, we see a renewed interest in the study of human life and nonhuman life-forms as evidenced by the establishment of biology as an academic discipline at the beginning of the 19th century. An important task of this new scholarship was to develop taxonomies to organize the different life-forms and to identify their relationships. One man who famously contributed to this task was the Englishman Charles Darwin. Freshly graduated from a Christian college in 1831, Darwin set sail for a five-year journey around the world. On this journey, he made geological observations and collected numerous specimens of living and already extinct animals. On various points during this journey, Darwin sent home written reports of his observations together with some specimens. Because his communications were well received, Darwin quickly achieved scientific recognition and was treated as an authority upon his return to England in 1836. Back home, Darwin sought the help of other experts to categorize his collection. Together, they identified individual species and tracked their existence across different geographical regions. Thus, Darwin observed that individuals from the same species but different origins sometimes showed small physical variations. This observation made Darwin think about the forces that created variations among species and made him pursue the possibility that one species could merge into another. Darwin first published the results of this pursuit in *The Origin of Species* (Darwin, 1864), where he formulated his theory of **evolution** based on natural selection.

The crux of his theory is thus: Although a species is defined by a set of characteristics, individuals within that species show considerable variation. For example, giraffes vary in the lengths of their necks. Due to the variation within a species, some individuals are better equipped to face nature's challenges than are others. In an environment where food hangs high, giraffes with longer necks would be more likely to sustain themselves than would giraffes with shorter necks. As a consequence, long-necked giraffes would be better able to reproduce and raise offspring, thereby passing on their long necks to future generations of giraffes. Over time, we would see an increase in the average neck length of giraffes and thus a change in the morphology of this species. As there are many ways in which a species could adapt to its environment, there are many possibilities for change. Thus, the changes that occur within one species may result in a multitude of related species, as in the case of mammals and primates.

Darwin's evolutionary theory summarized what humans knew implicitly since they started to purposefully domesticate animals such as dogs, cattle, and poultry about 12,000 years ago (Driscoll, Macdonald, & O'Brien, 2009). Yet the deep-seated belief in an Earth designed by God with humans as a special kind of creature, a master over all others, was difficult to overthrow. Therefore, Darwin's theory, although ingeniously making sense of hitherto conflicting observations, created a raging controversy. This controversy was fought publicly by Darwin's friends and colleagues, who defended natural selection as the principle for evolution. Darwin himself, however, withdrew from the public to live, study, and write in relative seclusion. He wrote several important works during this time, one of which is particularly relevant for the study of emotions.

The work in question is a book entitled *The Expression of the Emotions in Man and Animals* (Darwin, 1872). First published in 1872, it was Darwin's last big treatise and the

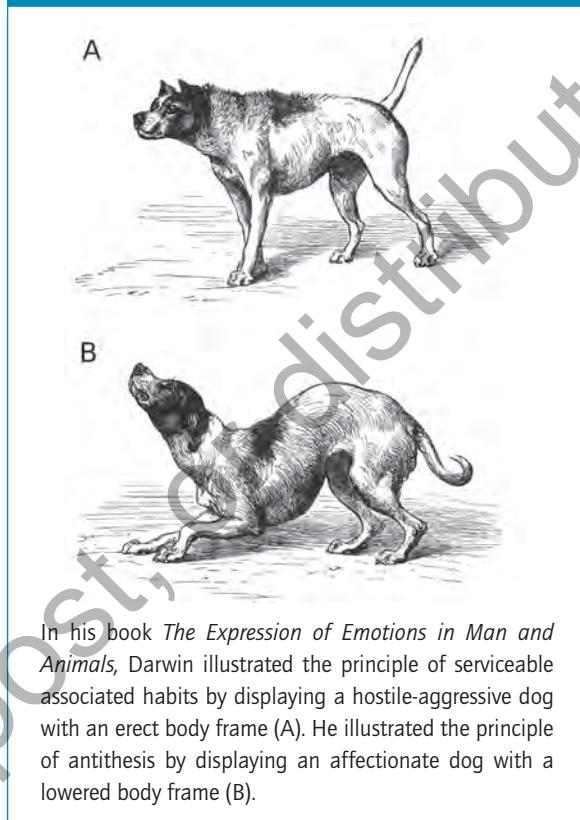
one where he was most careful not to offend his audience and to keep references to natural selection at a minimum. Yet he wrote his emotions book in an evolutionary spirit and, for the first time, drew a clear parallel between the emotional life of nonhuman animals and humans. Perhaps surprisingly, Darwin never raised the issue of whether nonhuman animals have emotions but simply took for granted that they do. Moreover, he held that certain principles govern emotion and emotional expression, and that these principles apply similarly irrespective of species. In the following section, we review Darwin's principles and also touch on other contents of his book.

The first principle Darwin called "the principle of serviceable associated habits." It expressed the idea that animals, humans included, perform certain voluntary actions because they are useful in a given context. For example, you might avert your face and cover your nose and mouth at the sight of rotten food or a cadaver.

Over time, such actions become a habit that is then not just associated with a specific context but also with a specific mental state, or emotion. Thus, any time you experience that emotion, you feel the urge to move according to the acquired habit. Darwin suggested that habitual expression is passed on to offspring; he thus made reference to [Lamarckian theory](#) on the inheritance of acquired characteristics rather than his own ideas about natural selection to explain continuity in emotion expression across successive generations.

Darwin's second principle was called "the principle of antithesis," and it derived from his first principle. It held that certain expressions emerged because they came to represent the opposite of serviceable habits. As an example he mentioned the dog, which in a hostile state of mind is stiffly erect, its fur raised, eyes glaring, and teeth exposed (Figure 1.6). This expression, so Darwin argued, is a serviceable habit, associated with the action of fighting. A dog falls into the opposite behavioral display when it is in an affectionate state of mind. Here, the body is fluid, the fur flat, the eyes partially closed, and the frame lowered, making

FIGURE 1.6 Darwin's Dogs



Source: Charles Darwin, *The Expression of Emotion in Men and Animals* (1872).

FIGURE 1.7 Duchenne's Expressions



In his writings on human facial expressions, Darwin referred to the work of Duchenne de Boulogne, who had studied human facial expressions and their muscular underpinnings. By electrically stimulating individual facial muscles, Duchenne had shown that different muscle groups contribute to different facial expressions. The picture is taken from Duchenne's monograph "Mécanisme de la physionomie humaine," first published in 1862.

Source: Wikimedia Commons.

the dog appear smaller than it is (Figure 1.6). Darwin believed that the latter display simply arose from being the practical opposite of the former, and he did not assume it to be functional. However, one can make a case that these and other expressions, which fall under Darwin's second principle, are useful in their own right. For example, the dog's affectionate behavior may effectively signal submissiveness toward or dependency on a higher-ranked animal or its master.

The third and last basic principle of emotion expression was "the principle of actions due to the constitution of the **nervous system**, independently from the first of the will and independently to a certain extent of habit." He called this principle more "obscure" than the others—and so it is. Darwin assumed that not all expressions are serviceable habits or their opposites. He argued that some expressions are chiefly due to changes in the nervous system under certain mental states. As an example he gave trembling, which "is of no service, often of much disservice, and cannot have been at first acquired through the will and then rendered habitual in association with any emotion."

In the remainder of his book, Darwin described emotional expressions of many species, including reptiles, birds, and mammals. When turning to humans, he paid particular attention to facial expressions (Figure 1.7) and explored their characteristics and causes for different emotion groups, reminiscent of Descartes' primary and secondary emotions. Moreover, like Descartes, he linked emotions to bodily changes (e.g., heart rate) and behavior. Although he made no formal attempt to define emotions, his thinking is evident from statements such as, "Anger and joy are from the first exciting emotions and they naturally lead, more especially the former, to energetic movement, which react on the heart and this again on the brain" (p. 84). Darwin thought that the experience of emotions results in some excitation of the nervous system and the release of "nerve-force." However, it is unclear what exactly he meant by nerve-force and how an emotional state differs from any other mental state. In fact, he included a range of mental states in his discussion (e.g., reflection, pain) that by present definitions would not be considered emotions.

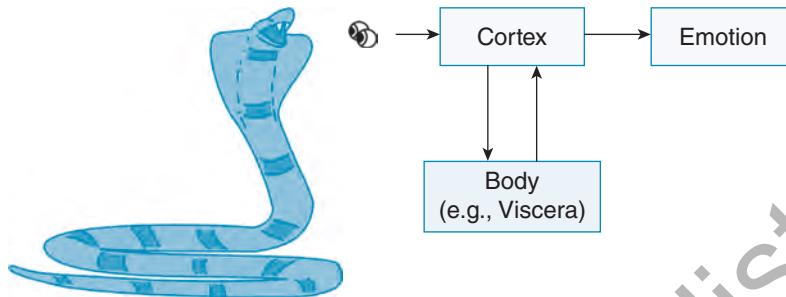
ESTABLISHMENT OF PSYCHOLOGY AS A DISCIPLINE AND EMOTIONS AS A TOPIC FOR PSYCHOLOGICAL INQUIRY

Darwin's biological perspective on mental processes as well as new insights on the workings of the brain produced changes in the way scientists and philosophers approached matters of the mind. Some no longer considered the mind as something accessible through philosophical insight only, but as something measurable and quantifiable. These individuals departed from philosophy and established a new discipline called psychology. In Europe, this movement was headed by Wilhelm Wundt, who set up the first experimental psychology laboratory in 1879. At around the same time, William James established psychology as a discipline in the United States. Although both individuals discussed emotions in their writings, we will now turn to James, as his contributions to emotion theory were more significant.

James criticized previous work on emotion, suggesting that it was mostly concerned with classifying different emotion states. Moreover, unlike his predecessors, he assumed that everyone feels something akin to grief, fear, rage, or love and that most other emotion terms (e.g., malice, spite) simply reflect differences in the eliciting object, not the underlying emotion. Thus, rather than worrying about emotion terms, James was interested in identifying general principles that apply to all emotions.

One of these principles was what exactly constitutes an emotion. To this end, he made a proposal that, although anticipated by René Descartes, turned contemporary notions upside-down. Specifically, he proposed that emotions arise from one's perception of bodily changes induced by emotion-provoking situations (James, 1884). According to James, emotional situations elicit brain representations of external events, which trigger emotion-specific bodily changes, specifically in the **viscera**—defined as the internal organs such as the stomach, heart, or liver. For example, the visual perception of a dangerous animal such as a snake or bear, he thought, affects the viscera as well as other bodily aspects (e.g., muscular tension) and moves an individual to flight. James held that this happens instinctively or reflex-like and that bodily consequences are relayed back to the brain (A Closer Look 1.2), which then gives rise to what we call an emotion (Figure 1.8).

Shortly after James published his thoughts on emotions in 1884, Carl Lange incidentally put forth a similar set of ideas, which are now referred to as the James-Lange theory. However, as this theory contradicted the common belief that bodily changes result from emotions—and not the other way around—it met with a lot of criticism. Its opponents, including Wundt, contended that bodily changes occur at a slower rate than does the experience of an emotion, that they are not specific enough to possibly enable different emotions, and that situational factors are often more important than the emotional object itself in influencing states of feeling. James addressed some of these and other criticisms in an 1894 publication (James, 1894). For example, he stressed that it is the perception of the situation as a whole rather than an individual object that triggers bodily changes. However, as he had no experimental data to support his theory, and exact information about the temporal course and specificity of bodily changes was unavailable, no definite conclusions could be drawn. James acknowledged this to be the case and encouraged other researchers and physicians to put his ideas to the test.

FIGURE 1.8 The James-Lange Theory of Emotion

According to James and a contemporary Danish physician, Carl Lange, the perception of an emotional object (e.g., a snake) at the level of the cortex triggers bodily responses. For example, it might increase an individual's heart rate and change the activity of other bodily organs. These changes were presumed to feed back to the brain, where they are experienced as an emotion.

A CLOSER LOOK 1.2

FIGURE 1.9 William James

Source: Harvard University Archives, HUP James, William (5).

William James and the Brain

William James (1842–1910) was born into a wealthy, cosmopolitan New York family. He went to medical school at Harvard University and stayed there as a lecturer and professor for most of his career. Although he started off as a medical doctor, James achieved his greatest fame through work he conducted in psychology and his efforts to establish psychology as a discipline in the United States. In his writings, James approached a wide range of psychological topics, including consciousness, attention, memory, and perception of time.

Perhaps due to his medical background, James was genuinely interested in the brain and looked at brain evidence to inform his psychological theories. For example, he held that evolution modified the brain and that it enabled more advanced processing in species more closely related to humans. Moreover, he distinguished between lower and higher brain centers responsible for more reflex-like and deliberate actions, respectively. During James's

lifetime, however, neuroscience was still in its infancy, and detailed models about brain function were lacking. For example, the brain was held as a sensory-motor device specifically dedicated for perception and volition. Many thinkers, including James, still viewed the mind or soul as a separate entity that moved independently and possibly in parallel with what was going on in the brain.

Nevertheless, James considered the brain of importance for all mental processes—including emotions. In *The Principles of Psychology* (James, 1890, p. 17), he examined how frog behavior is affected by the removal of different parts of the central nervous system. After removing the two cerebral hemispheres, James observed, "Fear . . . seems to have deserted him [the frog]. In a word, he is an extremely complex machine whose actions, so far as they go, tend to self-preservation; but still a machine. . . ." Thus, he believed the two cerebral hemispheres to be important for emotions. While James assumed the hemispheres to be largely unorganized at birth and to become organized during an individual's lifetime, he also held that they possess "native tendencies," which he called instincts and emotions. The following quote illustrates how he conceived emotions to occur (James, 1890, pp. 473–474):

Supposing the cortex to contain parts, liable to be excited by changes in each special sense-organ, in each portion of the skin, in each muscle, each joint, and each viscus, and to contain absolutely nothing else, we still have a scheme capable of representing the process of the emotions. An object falls on a sense-organ, affects a cortical part, and is perceived; or else the latter, excited inwardly, gives rise to an idea of the same object. Quick as a flash, the reflex currents pass down through their preordained channels, alter the condition of muscle, skin, and viscus; and these alterations, perceived, like the original object, in as many portions of the cortex, combine with it in consciousness and transform it from an object-simply-apprehended into an object-emotionally-felt. No new principles have to be invoked, nothing postulated beyond the ordinary reflex circuits, and the local centers admitted in one shape or another by all to exist.

During the 19th century, emotion theory matured from a topic of philosophical interest to a psychobiological framework that was directional for much of the research conducted since then. The inception of biology as a discipline, as well as contemporary developments in medicine, highlighted both body and brain processes as important and encouraged cross-species comparisons that identified basic aspects of emotions that are preserved across species. Furthermore, the inception of psychology as a discipline formalized the scientific inquiry into mental processes and led to the development of testable emotion theories. Prominent among them was the James-Lange theory, which integrated contemporary biological, medical, and psychological insights. The debate and interest ignited by this theory fueled subsequent emotion research, which confirmed some but not all of its claims. One of the claims that stood the test of time is that bodily changes feed back to the brain. Although this feedback is not necessary, as suggested by James, it was found to critically modulate and potentially trigger

emotions. Therefore, contemporary writing still reminds us of James and his important contributions to emotion theory.

SUMMARY

Many generations of thinkers were intrigued by the feeling states called emotions and aimed to understand their nature and function. Philosophers of ancient Greece laid the foundation for subsequent views on emotions. For example, they drew a divide between thinking and feeling, introduced the role of both intellect and body in emotions, and established key concepts such as that of emotional valence. During the post-Renaissance period, these ideas were augmented by a first comprehensive theory of emotions put forth by René Descartes. Among other things, he linked emotions to the brain, differentiated between primary and secondary emotions, and made a case for their usefulness or functional significance.

Descartes' ideas and those of earlier philosophers made an important mark. However, due to the nature of philosophical inquiry and information exchange at that time, this mark was temporarily not well recognized and often remained uncredited. During the course of the 19th century, the nature of inquiry became more scientific or evidence-based, and information exchange became more formalized through the establishment of new disciplines, international conferences, scientific journals, and **peer review**. Together, these developments facilitated the integration of knowledge and prompted empirical research that systematically tested predictions derived from existing theoretical frameworks. Moreover, existing theories were pushed to the next level by new insights about the evolution of physical and mental traits, nonhuman animal emotions, and the triangular relationship between emotions, body, and brain. Thus, 19th-century science, spearheaded by scholars such as Darwin or James, set an agenda for emotion research that motivated a growth of the field in the 20th century and enabled many key discoveries.

THINKING CRITICALLY ABOUT “EARLY EMOTION THEORIES”

1. How did ancient philosophy conceptualize emotions? Discuss whether and in what way this changed throughout history.
2. For much of history, emotion theory developed quite slowly. This changed toward the end of the 19th century, when we see an increased interest in the topic. Why did this increase not occur earlier?
3. Many scholars postulated supposedly new ideas that others had already introduced. Identify some of these ideas and think of why older scholars were not always recognized.

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Aristotle's *Rhetoric*: <http://classics.mit.edu/Aristotle/rhetoric.html>

René Descartes' *The Passions of the Soul*: <http://net.cgu.edu/philosophy/descartes/index.html>

Charles Darwin's complete published work as well as a collection of private writing and unpublished manuscripts: <http://darwin-online.org.uk>

William James's published work: <http://www.uky.edu/~eushe2/Pajares/james.html>

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