The idea for a World Wide Web was first proposed by Tim Berners-Lee in 1989. Since then, information technology has extended into all of our worlds. People keep in touch through social networks, blogs, messaging services and video calls; students get course information and interact with their tutors through virtual learning environments; businesses sell goods and services online and promote their brands through online advertising campaigns; and so on. The reach of information technology is constantly being extended and evolving into new and unexpected forms.

We are currently getting to grips with understanding the consequences of this new technology for how we process information and interact with each other. Already we are seeing how videos posted on the Internet can make powerful political propaganda. Micro blogging services were used to organize resistance during the Arab Spring revolts and, apparently, to coordinate looting and rioting in the United Kingdom in 2011. A completely new vocabulary, including ‘tweeting’, ‘FBing’ and ‘sexting’, has been coined to describe activities that were unknown only a generation ago.

How do these technologies fit in with our basic cognitive and emotional make-up? Do they fundamentally change us or does their use fit in with processes that were fixed thousands of years ago?
These are the types of questions that the science of psychology tries to answer. Of course, they are not the only questions; indeed, there are many. In this book, for example, we will examine questions of human development, asking how we mature from birth, through childhood to old age. We will look at what drives and motivates us, how we characterize and understand the wide range of emotions and feelings that we all experience. Along the way, our goal is to help you get insights not only into the attention-grabbing things that can go wrong but also into the often-overlooked but miraculous things that usually go right. Many interesting examples are highlighted in ‘Psychology around Us’ boxes. We have also included several ‘Practically Speaking’ boxes, which we hope will help you in your academic and working life. Every journey needs a first step. In this chapter, the first step is to learn how the science of psychology has been defined in very different ways and with fundamentally different assumptions and goals. This has led to the development of different approaches and perspectives within psychology. To understand these different approaches and perspectives we will examine the origins of the discipline.

**PSYCHOLOGY AROUND US**  Myth vs. Reality

Go to a party and tell strangers that you are a psychologist, and they will most likely ask you if you can read their body language or if you know what they are thinking. It is quite likely that they will tell you what psychology is all about and start sharing their diagnoses of their friends and of themselves. They may well tell you all about their anxieties or phobias. Most people believe that all psychologists are therapists, when, in fact, clinical psychology is but one specialty in a field that includes cognitive, social, developmental and sports psychology, among many others. Like most scientific fields, many myths surround psychology, myths that lead to inaccurate stereotypes about psychologists and the phenomena that they study. Here are a few of them:

**MYTH #1:** The nature versus nurture debate was put to rest years ago. In fact, it is still very much alive in psychology.

**MYTH #2:** Most mental disorders have clear and dominant biological causes. It just seems that way because so many drug treatments are available for people with psychological problems. In fact, we still have much to learn in this realm.

**MYTH #3:** The brain does not produce new neurons after childhood. Actually, current research indicates that new neurons continue to be formed throughout life, even in old age.

**MYTH #4:** As most people age, all of their mental functions decline. In fact, in normal ageing, many mental functions hold up very well, and some actually improve, for example vocabulary and certain other verbal skills.

**What Is Psychology?**

**LEARNING OBJECTIVE 1**

Give definitions of psychology, and describe the goals and levels of analysis of different approaches to psychological sciences.

Chances are that you, like Marc below, often find yourself reflecting on why people, including you, think and act as they do. You may wonder, for example, why you cannot seem to settle down and start your assignment. You may be curious about why a friend of yours is attracted to someone you find repulsive. You may sense that a family member is depressed and may try to think of ways you can help. All of us, in short, have an interest in understanding other people and ourselves either for practical reasons or simply because it is such a fascinating subject.

The systematic, empirical study (or science) of selves and others is known as psychology. Psychology jostles for room amidst other sciences such as sociology, linguistics, anthropology and economics and borrows ideas...
from and lends them to the neurosciences and medical sciences, including psychiatry. Psychology is not just an academic subject taught and learnt for its own sake; it also refers to a profession with carefully considered entrance qualifications, ethical standards and rules of conduct providing expert advice and guidance based on research evidence in realms of human life, including mental disorders, education and business.

**Psychology as the Science of Mind or Behaviour, or Both?**

What unites psychologists is their commitment to building accounts of selves and others on the foundations of systematic, empirical research. It is not enough to simply cite authority or opinion. Theories in psychology must be backed up by research evidence and logical argument. As we shall see when we look at the history of psychology, some psychologists begin their account of what it is to be human by looking inwards and examining mental processes. These mental processes include complex experiences, such as anger love and even the act of lying. During psychology’s early history, the primary method for exploring internal mental processes was to introspect (i.e. to carefully describe one’s experiences). For these early psychologists, psychology was primarily a science of mind. Other psychologists distrusted introspection and attempted to build a science of psychology not on how an individual privately experiences the world but on what any individual, irrespective of their background, opinions or motivations could directly observe when looking at themselves or others, in other words publicly observable behaviour.

For much of the history of psychology these two perspectives have been mutually exclusive; psychologists were either for mind or for behaviour, but not both! Some psychologists have tried to build bridges between the two approaches or have tried to show that mind is really behaviour or that behaviour is really mind.

When you read the upcoming chapters, you can try to identify which perspective is taken in particular theories or research studies.

When psychologists study mental processes and behaviour, irrespective of whether they are more interested in mind or behaviour, they generally have one of the six following goals in mind:

- **Description.** Psychologists seek to **describe** very specifically the things that they observe. As you read this book, you will see that psychologists have described phenomena ranging from how babies learn to talk to how humans fall in love, make decisions and more.

- **Explanation.** Telling what, where, when and how are sometimes not enough. A key goal for many psychologists is to answer the question ‘Why?’ As we will see in Chapter 2, psychologists have developed hypotheses and theories to **explain** a huge variety of events, from why we get hungry to why we either like or do not like parties.

- **Prediction.** Psychologists also seek to **predict** the circumstances under which a variety of behaviours and mental process are likely. You will learn later in this book, for example, about research that predicts the conditions under which we are most likely to offer help to a stranger in need.

- **Control.** We often encounter situations in which we want to limit or increase certain behaviours or mental processes, be they our own or those of others. Psychology can give people advice on controlling behaviours, ranging from how to limit unhealthy stress to how to remember more from a class.

- **Understanding.** Sometimes, we encounter people or situations that we find completely incomprehensible. This may be the case when we study people from very different cultures who engage in practices we find perplexing. For example, in some cultures female circumcision is seen as a natural part of growing up, while for those of us not brought up in that culture the practice is both criminal and abhorrent.

- **Personal Development.** Some psychologists argue that prediction and control miss some of the important dimensions of human existence. They argue that becoming a more rounded and happier person is the central focus of psychological research. The humanistic psychologists, who we will discuss later, are examples of this point of view.

In order to describe, explain, predict, control and understand mental activity and behaviours or, for that matter, change or develop oneself, we need to recognize how these processes are embedded in complex webs of influence. We can categorize these influences in a series of levels, starting from what goes on within the individual (intra-personal), such as brain and cognitive process, then moving to explanations that use processes that go on between individuals (inter-personal) to explanations which depend on group
attraction. To fully understand why we find some people more attractive than others, we may need to look at a genetic contribution since evolutionary psychologists have argued that certain physical attributes indicate fitness to breed and that we are therefore ‘pre-programmed’ to find them attractive (intra-personal level). We may need to look at reciprocity in a relationship: we find people attractive if they find us attractive. This would be at the inter-personal level of analysis. At the inter-group level, we may have to consider the social background of the individuals; social class, for example, may influence how we dress, which in turn identifies us as belonging to certain groups. At the cultural level we may have to consider their shared beliefs about appropriate conduct for men and women and the expression of interest in the opposite sex.

We have examined what kinds of phenomena psychologists study. Next, we will consider how the different approaches and perspectives we find in contemporary psychology started life. We will discuss how psychology got its start, how historical and societal factors have affected what psychologists do and how psychologists have shifted their energies among the different goals and levels of analysis over time. We will then consider where the field of psychology is today and where it may be going tomorrow.

<table>
<thead>
<tr>
<th>Level</th>
<th>What Is Analysed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-personal processes</td>
<td>Processes that go on ‘under the skin’ or in the brain. The biological correlates of intelligence or personality would fit in here</td>
</tr>
<tr>
<td>Inter-personal processes</td>
<td>Processes that occur once an individual encounters someone else. The phenomenon of social facilitation when the mere presence of another person improves performance on a wide variety of tasks would fit in here</td>
</tr>
<tr>
<td>Inter-group processes</td>
<td>Processes that are affected by group membership. A football fan will react differently to meeting a rival fan from how they will react to meeting an individual who supports the same team</td>
</tr>
<tr>
<td>Cultural/Societal processes</td>
<td>Processes that are related to broad cultural factors. Social psychologists have found that in Western countries which embrace an individualistic way of thinking judgements about success and failure are different from those in cultures which stress the importance of communal life</td>
</tr>
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Before You Go On

What Do You Know?
1. How is behaviour different from mental processes?
2. What are the four levels of analysis in psychology?

What Do You Think?
Why might understanding the use of social networks need to include intra-personal, inter-personal, inter-group and cultural levels of explanation?

Psychology’s Roots in Philosophy

LEARNING OBJECTIVE 2
Describe how from the time of the Ancient Greeks to the mid-19th century philosophers and scientists viewed the relationship between mind, body and soul.

In a time before universities and specialist subjects, Ancient Greek thinkers knew no academic boundaries and mixed topics and debates that today we think of as belonging to specific areas of inquiry, such as psychology, moral philosophy, the philosophy of science, theology, physics, biology and medicine. One topic that concerned many Ancient Greeks thinkers was identifying what it is that distinguishes the living from the dead and distinguishes human beings from other living beings. They speculated that these differences were the result of humans having or being psuche, or ‘souls’, and put forward different accounts of the relationship between the soul and the body, the persistence or otherwise of the soul after death and how the soul can come to know the world. It is from the Ancient Greek word psuche that we eventually got the ‘psych-’ of psychology.

The most well known of the Ancient Greek thinkers are Socrates (c. 470–399 BCE), Plato (c. 427–347 BCE) and Aristotle (c. 384–322 BCE). These thinkers have influenced generations of Western thinkers, and many psychologists still refer to them to this day. Socrates left no written work so we only know of him through the writings of his pupil Plato. Socrates cultivated the idea of living an ‘examined’ life, during which one must...
question authority and receive opinion and put arguments to the test through the employment of logic. Plato argued that we live in a world of endlessly shifting shadows and that philosophers could show us how to move out of these shadows to a sunlit world of pure, eternal knowledge. Plato likened the human predicament to a charioteer trying to drive and control two wild and powerful horses. One horse represented our appetites; the other, pride and passion; the charioteer represented reason. For Plato, the bodily seat of reason was in the brain. He deemed the world around us as temporary and cruel and something to be escaped. This was not the case for Aristotle, the son of a medical doctor, who took a keen interest in natural history. Aristotle found the world to be a never-ending source of wonder. One of his basic theories was that there were different kinds of souls and that these souls could be placed in a hierarchy. The simplest soul is the ‘vegetative’ soul found in plants, which allows them to grow and reproduce. Animals have a ‘vegetative’ soul and a ‘sensitive’ soul, which allows them to perceive the world around them. Humans have a ‘vegetative’, ‘sensitive’ and, crucially, a ‘rational’ soul. This rational soul is capable of reflection and language.

Ancient Greek physicians, or medical doctors, contributed to debates on the nature of the soul. Hippocrates (c. 460–377 BCE), a Greek physician, argued that the universe was built up from four elements: fire, water, earth and air. These elements were found in the body in the form of humours – four bodily fluids (blood, phlegm, yellow bile and black bile). A person’s particular combination of humours, argued Hippocrates, determined their character and well-being and predicted their responses to various situations. Hippocrates also correctly identified the brain as the organ of mental life (Figure 1.1). Ancient Greek philosophy was kept alive by the Romans, but after the fall of the Roman Empire many Greek and Latin texts were lost. The vigorous debate of the Ancient Greeks was replaced by reverence for God and the authority of the Church. Christian thinkers developed philosophical ideas within the bounds of Christian thinking and fused the philosophy of the Ancient Greeks with Biblical teaching. St Augustine produced a version of Platonism compatible with the Church, and St Thomas Aquinas produced a Christian version of Aristotle. These teachings formed the core curriculum of the newly formed universities and persisted for centuries.

**The Scientific Revolution**

During the 16th and 17th centuries, some of the accepted teachings of the Church about the world and, in particular, the reliance on the rote learning of Aristotle, was questioned by thinkers such as Francis Bacon (1561–1626) in England and René Descartes (1596–1650) in France. Isaac Newton (1642–1727) revolutionized physics by showing how diverse events such as the falling of an apple and the motion of the planets could be understood using the concept of gravitation and that the theory could generate predictions that could be tested through observation. Two great philosophical traditions emerged. Following Descartes, the rationalists stressed the importance of clear and distinct ideas which could only be identified by ignoring our senses. This view was often associated with the theory that knowledge was innate and simply needed working out through the application of reason. A good
end of the 19th century had emerged as a separate scientific field of investigation and by the mid-20th century distinctive approaches and perspectives on the subject had developed. We will now consider seven of these approaches, or perspectives, that have been particularly influential.

Wundt and Introspection (1)
In 1879, a former assistant to von Helmholtz, Wilhelm Wundt (1832–1920), opened a laboratory in Leipzig, 

example of a rationalist philosopher is Gottfried Leibniz (1646–1716). In contrast, the empiricists argued that sensory information is all that we have and that all knowledge must be traced back to the sensations that cause them. A good example of an empiricist philosopher is John Locke, who popularized the blank slate, or tabula rasa, hypothesis, which states that our mind is empty of content at birth and must be filled with the knowledge gained from experience. The implications of rationalist and empiricist accounts of knowledge, and the types of minds we must have to have that knowledge, were worked out over the following centuries. Immanuel Kant’s (1724–1804) ultimately failed attempt to reconcile the two traditions helped to continue the development of Western thought.

During the 18th and 19th centuries, physiological and medical knowledge was developing and anatomists began to map the brain and the structure of the nervous system. This process was advanced when German scientists began to use the methodological techniques employed by physicists in the field of physiology. Johannes Müller (1801–1858) showed that some nerves delivered impulses from the sense receptors to the brain while others delivered motor impulses from the brain to the muscles. A student of Müller’s, Hermann von Helmholtz (1821–1894), managed in 1850 to measure the speed of the nervous impulse by timing how long it took for a frog’s muscle to contract after the nerve connected to it was stimulated. In England, Charles Darwin showed that the development of different species could be explained in terms of natural variation and selection and that there was no reason for supposing that human attributes could not be explained in the same way. Post Darwin, a non-religious account of the development of the psyche was available.

Charles Darwin (1809–1882) The theories by the English naturalist about human evolution opened the way for later psychologists to understand the mind as a natural phenomenon.

The Founding of Psychology

LEARNING OBJECTIVE 3
Name important early psychologists and describe the main schools of psychological theories: introspection, psychoanalysis, functionalism, psychometrics, Gestalt, behaviourism and humanistic.

Against this background of increasing technical sophistication and an increasing willingness to think of humans as ‘natural’ rather than ‘spiritual’ beings, psychology by the
Germany dedicated to the study of psychology. Wundt had wide interests encompassing philosophy, history, ethics and anthropology. Psychology was, for Wundt, the foundation for these other disciplines because it was based on immediate or direct experience. The data for other disciplines, such as physics or history, were abstracted from these immediate data so a study of psychology was a logical priority. Fundamental to Wundt’s psychology was his idea that the mind is not a thing but an activity and that when we experience the world we do so from a particular perspective that we construct on the basis of our history and situation. Our experience is therefore a result of selection and is an action of the will rather than a passive recording of what is in front of us. This approach to the mind is known as voluntarism.

To study psychological processes Wundt advocated the use of introspection in very carefully controlled conditions. He believed that psychology could only study simple mental phenomena and that more complex phenomena which relied on language or culture needed different methods of research. He therefore made a clear distinction between experimental psychology and a form of cultural psychology he called Völkerpsychologie. Wundt’s experimental psychology generated huge interest and his students went around the world founding their own psychology laboratories. Wundt wrote many volumes on Völkerpsychologie in which he analysed the writings of anthropologists, linguists and historians in an attempt to understand how cultures develop.

**Psychoanalysis: Psychology of the Unconscious (2)**

Wundt was instrumental in founding psychology in the academic setting of the university. A close contemporary of Wundt did not work in an academic environment but instead worked in the psychiatric hospital and the private consulting room.

Sigmund Freud (1856–1939) was a Viennese neurologist who suggested that many of our thoughts and feelings existed beyond the realm of conscious awareness and could not be revealed by introspection. This unconscious mind is organized around basic and often socially unacceptable desires. To stress how alien these desires are to our normal selves, Freud called this part of the mind the id, or the ‘it’. These desires are kept in check by a part of the mind that is geared to self-protection and dealing with reality. This part of the mind Freud called the ego. To reveal these hidden parts of the mind that the ego represses Freud invented the technique of psychoanalysis. When we are sleeping, our mind is at its most relaxed and, therefore, the ego is at its weakest. By talking about one’s dreams to an analyst the patient could understand what was going on in his or her unconscious.

Freud recognized that we are not just governed by blind desire and self-protection: we can act morally. The part of the mind that generates moral judgements Freud called the superego. Freud explained the development of these parts of the mind. He argued that the child is born into the world as a little bundle of simple and pressing desires for food and comfort (id processes) and through processes of maturation and interaction with parents and others develops an ego and superego.

Freud’s theories have been controversial since they were first published. This controversy is, in part, because of Freud’s direct discussion of the development of sexuality through childhood and adulthood. It is still the case that psychoanalysis has a firmer foothold in the clinic than the university.

**Functionalism: The Practical Application of Psychology (3)**

William James (1842–1910) set up the first psychology laboratory in the United States at Harvard University and wrote one of the first important psychology texts, *Principles of Psychology*. James was both a psychologist and a philosopher. As a philosopher, he is associated with pragmatism, the doctrine that knowledge is to be evaluated in terms of its usefulness rather than by eternal standards. As a psychologist, James described himself as a functionalist in order to stress the purposefulness of mental life. In this sense he agreed with the voluntarism of Wundt. James did not produce a systematic overarching theory of psychology but was highly influential. He stressed that psychological knowledge should be used to benefit humanity and emphasized the need for research to include animals, children and persons with mental disorders in order to understand both normal and abnormal psychological functioning (Stam, 2010; Richardson, 2006).

Spurred on by the functionalists’ efforts to provide more useful information, psychology began to tackle socially
relevant topics. The researchers William Lowe Bryan and Noble Harter (1897), for example, performed a famous investigation of how quickly telegraph operators could learn necessary typing skills. Their findings were used to improve training for railroad telegraphers, and the study is now widely regarded as one of the first to have a major social and commercial impact. Functionalism also marked the beginning of exploration into socially important issues such as learning and education. Indeed, *educational psychology* remains a key area of research in the field today.

**Psychometrics: Measuring the Mind (4)**

An approach to psychology that was also influenced by Darwinian ideas about the ‘adaptive’ function of the mind began life in England at around the same time as James was writing his famous textbook. Francis Galton (1822–1911), a cousin of Charles Darwin, was consumed by a passion for measurement, statistics and the theory of evolution. He put these passions together to found the *psychometrics* approach to psychology. Galton hoped to measure natural variation amongst people and to use this information to provide evidence for human evolution and to provide practical advice about human breeding. He called the latter project *eugenics*, which is a Greek term for ‘good genes’. Galton assumed that many human characteristics such as ability and health were distributed according to a bell-shaped distribution that could be described in mathematically precise terms. From 1884 to 1885, Galton set up a laboratory at the South Kensington Museum in London to collect anthropometric (human measurement) data. While Galton’s measurements in his laboratory were not found to be related to ability and his eugenics programme was used to justify forced sterilizations of people deemed unfit to breed in both Europe and America, making his ideas controversial to this day, Galton’s assumptions about the distribution of characteristics and the possibility of measuring human attributes influenced many psychologists, who went on to found their own anthropometric or psychometric laboratories.

**Gestalt Psychology: More than Putting Together the Building Blocks (5)**

Wundt’s approach to psychology sharply distinguished between experimental psychology and *Völkerpsychologie*. His experimental psychology focused on a controlled introspection of simple processes. Other psychologists in Germany questioned this approach. They argued that Wundt’s psychology experiments were artificial and the elements of consciousness they identified were abstractions and did not really exist in our experience. Exponents of Gestalt psychology – Max Wertheimer (1880–1943), Wolfgang Köhler (1887–1967) and Kurt Koffka (1886–1941) – argued that we perceive things as broad ‘perceptual units’ rather than as individual sensations. Indeed, the word Gestalt means ‘whole’ or ‘form’. The school subscribed to the idea that ‘the whole is greater than the sum of its parts’.

For example, when you watch TV, you see complete pictures. In fact, each picture is made up of thousands of small dots, called *pixels*. If you get close enough to the screen, you can see the picture break down. Even so, your brain still favours blending those dots into a whole picture. Similar findings have been gathered regarding our tendency to group eyes, noses and mouths into recognizable human faces. Children three months of age or younger show a preference for human faces, but only when the various parts of those faces are arranged correctly into a facial appearance (Turati et al., 2010; Morton & Johnson, 1991).

**PSYCHOLOGY AROUND US ‘Music Is My Religion’**

This famous line is attributed to the legendary guitarist and songwriter Jimi Hendrix. Clearly, for Hendrix, music was a phenomenon whose wholeness was greater than the sum of its parts. Music is defined, fairly simply, as an arrangement of sounds that produces a continuous and unified auditory experience. Its elements include melody, tone, harmony, rhythm, pitch and timbre. But, of course, music is much, much more than the sum of these elements.

Like Hendrix, many musicians and songwriters have described music’s broad, special and almost mystical powers. Billy Joel said, ‘Music in itself is healing.’ Ray Charles claimed, ‘Music [is] a necessity for me – like food or water.’ Bono asserted that ‘music can change the world because it can change people’. And Paul Simon proclaimed that ‘music is forever’.

And let’s not forget the impact of music on scholars, scientists and everyone else. Physicist Albert Einstein once said, ‘I often think in music. I live my daydreams in music. I see my life in terms of music . . . I get most joy in life out of music.’
Gestaltists developed over 100 principles to describe how the brain and sensory systems perceive environmental stimuli. Some of the Gestalt laws are shown in Figure 1.2. Gestaltists viewed learning as tied to perception: the recognition and identification of stimuli that come through our senses. (We will discuss perception later in this text: see Chapter 7.) They also believed that problem-solving occurs when a person develops a sudden and complete insight into a solution. Indeed, they believed that problems remain in an unsolved state until such insights occur. The Gestaltists took psychology to be a science of the mind and placed great emphasis on the importance of examining conscious experience.

**Figure Ground:** The tendency to perceive one aspect as the figure and the other as the background. You see a vase or two faces, but not both at the same time.

**Proximity:** Objects that are physically close together are grouped together.

- ![Proximity Example](image)

In this figure, we see 3 groups of 6 hearts, not 18 separate hearts.

**Continuity:** Objects that continue a pattern are grouped together.

- ![Continuity Example](image)

When we see this, we normally see this plus this.

Not this.

**Closure:** The tendency to see a finished unit (triangle, square, or circle) from an incomplete stimulus.

- ![Closure Example](image)

**Similarity:** Similar objects are grouped together (the green colored dots are grouped together and perceived as the number 5).

- ![Similarity Example](image)

**FIGURE 1.2 Gestalt laws.** Gestalt psychologists studied how we perceive stimuli as whole forms or figures rather than individual lines and curves.

**Behaviourism: Psychology of Adaptation (6)**

Another school of thought that emerged in the early 20th century took a very different approach to those of both psychoanalysts and Gestalt psychologists. This area of psychology, called **behaviourism**, was founded on the belief that psychology should study only publicly observable events rather than private, conscious processes. This approach to psychology has its roots in laboratory studies of animal behaviour.

Behaviourism originated in the United States and Russia. In Russia, the Nobel Prize-winning
physiologist Ivan Pavlov (1849–1936) observed that dogs salivated when his lab assistants brought them food. Later, he noticed that the dogs also salivated when the lab assistants appeared, even when they brought no food with them. The dogs had learnt, or in the technical jargon been conditioned, to associate one stimulus (food) with another (lab assistants) and to respond in the same way to both. You will read more about Pavlov’s work in Chapter 9. By manipulating such factors such as how many times stimuli needed to be paired together for learning to take place or how learning could be extinguished by ‘un-pairing’ stimuli, Pavlov and his colleagues mapped the mechanisms of what later was called classical conditioning in a number of organisms, including sheep, apes and rats. Of particular interest to psychologists was the way in which relations between stimuli could be studied without bothering with introspective reports. In everyday language we might say that the dogs in Pavlov’s observations ‘expected’ food when they saw the lab assistants or stopped getting excited and salivating when the lab assistants came into the room after they had been ‘disappointed’ too many times. Pavlov could dispense with this language and simply count and measure behaviours.

John Watson (1878–1958) is generally credited with pioneering the school of behaviourism as an approach to the whole of psychology. He extended Pavlov’s animal work to young children and extended the reactions that could be measured from physiological responses like salivating to emotional responses and motor responses such as moving one’s leg.

B. F. Skinner (1904–1990) emerged as the leading behaviourist after World War II. He developed the methods and theories of Edward Thorndike (1874–1949), who conceptualized learning not so much as an association between stimuli presented to a passive animal but as an association between a behaviour and its consequence. Skinner developed this idea and studied how an organism ‘operated’ on the environment, hence his labelling this kind of learning as operant conditioning. The details of classical conditioning and operant conditioning are described in Chapter 9.

Behaviourism was not embraced by all, however. Some psychologists criticized John Watson and other prominent behaviourists for popularizing and, in their view, cheapening psychology by removing all reference to the mind and by suggesting that human behaviour, including art, poetry and philosophy, was no different except in complexity from the behaviour of a rat learning to run through a maze. In 1929, for example, psychologist Joseph Jastrow wrote that behaviourism’s portrayal in popular magazines and newspapers undermined psychology’s role as a valid science (Jastrow, 1929).

**Humanistic Psychology:**

A specifically American response to the perceived cheapening of human behaviour was humanistic psychology, which was orchestrated in the 1950s and 1960s by the so-called humanistic psychologists. These theorists rejected behaviourism and what they saw as the more pessimistic aspects of psychoanalysis, such as Freud’s insistence that he could not make anyone happy, just reconciled to their ordinary, mundane lives. Instead, they focused on what they saw as a uniquely human capacity for growth and development. Carl Rogers (1902–1987) and Abraham Maslow (1908–1970) argued that all people have the potential for creativity, positive outlook and the pursuit of higher values. If we could fulfill our full potential, these theorists believed, we would inevitably lead a positive life of psychological growth.

Humanistic pioneer. Carl Rogers was the founder of client-centred therapy, which promotes an equal relationship between therapists and clients and helps clients to achieve their full potential.

Source: © Michael Rougier/Time & Life Pictures/Getty Images, Inc.
Maslow, in fact, proposed that each of us has a basic, broad motive to fulfill our special human potential, which he called the drive for self-actualization. He suggested that anyone who achieved this broad motive would indeed lead a positive and fulfilling life. Maslow's hierarchy of human needs summarized his theory and is shown in Figure 1.3.

Carl Rogers developed a humanistic alternative to the psychoanalytic approach to psychotherapy, which he called client-centred therapy. According to Rogers, therapists should respect their clients as equals (not as a scientist observing a specimen). In this approach, the therapist establishes a trusting and warm relationship with the client by ‘mirroring’ feelings and conveying unconditional support and positive regard for the client. This very human approach to therapy played an important role in the establishment of the fields of clinical and counselling psychology after World War II.

**Before You Go On**

**What Do You Know?**

5. Which theorist is most closely associated with psychoanalysis (the theory that unconscious conflicts, rooted in childhood, affect much of our behaviour)?

6. What is operant conditioning?

7. What did the Gestalt psychologists study?

**What Do You Think?**

Which early school of psychology most closely resembles the way you view the human mind? Why?
Psychology in the 21st Century: Cognitive Psychology, Neuroscience and Evolution

LEARNING OBJECTIVE 4
Summarize the major principles of the cognitive, psychobiological and neuroscience approaches to psychology.

Up until the end of World War II, no single approach to psychology dominated the field. In America, psychoanalysis and behaviourism and, to a lesser extent, humanistic psychology competed for students and influence. European psychology followed in the footsteps of Wundt, Freud, the Gestalt psychologists and the psychometricians. In the 1950s, a new school of psychology emerged with roots in work done during the war to enhance human/machine interaction and the mechanical processing of information. Drawing on the work of information and computer scientists such as John von Neumann (1903–1957) and Norbert Wiener (1894–1964), the mind was conceived as an information processor that functioned in the same way as a digital computer. Cognitive researchers were able to observe the ‘inputs’ and ‘outputs’ of the mental system through carefully controlled experimentation. They then theorized about the internal mechanisms that must underlie such mental functioning, likening mental processes to the mind’s software and the human nervous system to the system’s hardware.

In 1967, Ulric Neisser published the influential book *Cognitive Psychology*. In it, he describes cognition as ‘all the processes by which . . . sensory input is transformed, reduced, elaborated, stored, recovered, and used’ (Neisser, 1967, p. 4). Neisser went on to define cognitive psychology as the study of information processing, the means by which information is stored and operates internally. Today, the field of cognitive psychology continues to greatly influence the study of memory, perception and consciousness, among other areas that we will discuss in this text.

Psychobiology/Neuroscience: Exploring the Origins of the Mind

The cognitive psychologists treated the mind as a digital computer linking input behaviour to output behaviour. On the whole they argued that information processing could be studied independently of the ‘machine’ it was running on. The implication was that cognitive psychology could be studied independently of the underlying brain. However, as we have seen, interest in the neurological basis of psychological phenomena can be traced through the work of Hippocrates, Aristotle, Pavlov and even Freud.

The study of psychobiology, now neuroscience, gained early momentum with advances in scientific and medical techniques. Karl Lashley (1890–1958), one of the most influential neuroscientists, based his work on the study of animal brains. Lashley used surgical techniques to destroy certain areas in the brains of animals. He then observed the effects of such destruction on memory, learning and other cognitive processes. Lashley found that the tissues in certain areas of the brain were often linked to particular cognitive functions. His ultimate goal was to pinpoint all areas of the brain responsible for memory, learning and other higher functions. He was never able to accomplish this goal fully, and it continues to be of major interest in contemporary research.

Roger Sperry (1913–1994), a researcher who was influenced greatly by Lashley, pioneered split-brain research on animals. Sperry and his colleagues cut the connections responsible for relaying information between the left and right hemispheres, or halves, of animal brains. They found that even after the brain is split surgically, the two hemispheres can often function and learn independently. Later investigators found similar results when they studied human beings who had undergone split-brain surgery to treat severe seizures (Gazzaniga, 2010, 2005). Split-brain research on both animals and humans made it possible to study the separate functioning of the brain’s hemispheres. As we will see in Chapter 5 such research remains a popular topic in psychology today.

Studying the human brain. Neuroscientists examine brain structure and brain activity to determine how they are related to behaviour. Here a researcher dissects the brain of a former patient with dementia as part of a study to learn more about memory and memory disorders.

Source: © Karen Kasmauski/Corbis Images.
A number of psychological subfields has been influenced by the field of neuroscience, as well as by Darwin’s early work on evolution. **Behavioural genetics**, for example, studies the influence of genes on cognition and behaviour. Another related field is sociobiology. **Sociobiologists** theorize that humans have an innate sense of how social behaviour should be organized, a sense brought about partly by evolutionary principles. In 1975, Harvard biologist Edward O. Wilson, a specialist on ants, brought great attention to this view with his book *Sociobiology: The New Synthesis*. He and other sociobiologists suggested that humans are genetically more predisposed than other organisms to learn language, create culture, protect territory and acquire specific societal rules and regulations. Sociobiologists did not claim that genetic and evolutionary influences are necessarily more important than environmental factors, such as parenting or the mass media. Rather, they proposed that our social behaviour is the result of both biological and cultural influences. One sociobiologist, David Barash (1979, p. 45), commented, ‘For too long social science and biological science have pursued “nothing but” approaches. Sociobiology may just help redress that imbalance.’

Sociobiology is now better known under the title of **evolutionary psychology**. Evolutionary psychologists hold that the body and brain are largely products of evolution and that inheritance plays an important role in shaping thought and behaviour (Table 1.2). The laws of evolutionary psychology are thought to apply to all organisms and to all kinds of mental functions and behaviours at intra-personal, inter-personal, inter-group and cultural levels of analysis.

**Evolutionary psychology** has become a very popular and controversial topic in psychology today (Confer et al., 2010;...)

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**TABLE 1.2 The Major Perspectives in Psychology Today**

<table>
<thead>
<tr>
<th>Perspective</th>
<th>Major emphases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychoanalytic</td>
<td>Interactions between the conscious and unconscious mind govern virtually all behaviour</td>
</tr>
<tr>
<td></td>
<td>Childhood experiences set the stage for later psychological functioning</td>
</tr>
<tr>
<td>Behaviourist</td>
<td>Only observable behaviour can be studied scientifically</td>
</tr>
<tr>
<td></td>
<td>Perspective focuses on stimulus–response relationships and the consequences for behaviour</td>
</tr>
<tr>
<td>Humanist</td>
<td>People can be helped to realize their full and grand potential, which will inevitably lead to their positive psychological growth</td>
</tr>
<tr>
<td>Cognitive</td>
<td>Mental processes are studied using an information processing model (inputs/outputs)</td>
</tr>
<tr>
<td>Neuroscience/Psychobiological</td>
<td>Psychobiological functions are explained primarily in terms of their biological foundations</td>
</tr>
<tr>
<td>Evolutionary</td>
<td>Behaviour and mental processes are explained in terms of evolution, inheritance and adaptation</td>
</tr>
<tr>
<td>Psychometric</td>
<td>Problem-solving and personality are studies using batteries of tests to identify patterns of functioning and to allow comparisons between individuals</td>
</tr>
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**PSYCHOLOGY AROUND US**

**Did Our Ancestors Prefer Blondes?**

One of the criticisms of evolutionary psychology is that it is fairly easy, and often inaccurate, to produce theories about how certain current behaviours, traits or emotions may have evolved from earlier times. Evolutionary psychologist Matthew Rossano, for example, writes, ‘It is quite tempting to observe a current behaviour and construct an evolutionary story [a “just so” story] about how that behaviour evolved for some adaptive purpose.

‘One of the best examples of this comes from the neuroscientist V. S. Ramachandran, who became so frustrated with what he considered to be the excess of unsubstantiated “just so” stories in evolutionary psychology that he made one up himself and called it “Why do gentlemen prefer blondes?”’

He proceeded to weave an imaginative tale about how, in our evolutionary history, fair-skinned females would have been preferable as mates because indicators of health, fertility, and sexual fidelity would have been more clearly visible than on their darker complexioned counterparts. He had no evidence, of course – just a plausible story. Much to his amazement, the article was accepted for publication! Critics of evolutionary psychology contend that “just so” stories have proliferated in the field, straining the credibility of the discipline.

‘On the other hand, this criticism is often used unfairly to smear the entire field of evolutionary psychology as nothing but “just so” stories.’ (Rossano, 2003, pp. 44–45)
Evolutionary psychologists suggest that some behaviours and mental processes are more effective than others at solving problems of living, namely ones that help people to survive and reproduce. These successful strategies are passed on to people's children, and they eventually become important parts of each individual's inborn make-up.

One goal of evolutionary psychologists is to identify cultural universality, human behaviours and practices that occur across all cultures. Just as behaviourists study animal behaviour to identify simple actions that form the basis of more complex human behaviours, evolutionary psychologists believe that uncovering universal human behaviours will help identify inborn functions common to all humans. Theoretically, such knowledge will answer important questions about the relative impact of biological factors and life experiences on our development.

Throughout this book, we will be observing a number of common practices displayed by people across all cultures, such as using certain facial expressions to express emotions, displaying a fear of snakes, telling stories and giving gifts. But are such common practices the direct result of evolutionary forces? Have these behaviours and reactions been passed on from generation to generation largely because they remain highly adaptive? Two evolutionary biologists, Stephen Jay Gould and Richard Lewontin (1979), do not think so. They argue that some of the traits and behaviours seen across cultures no longer serve an evolutionarily advantage and instead may be by-products of behaviours that did serve adaptive functions a long time ago. Initially, for example, the human smile may have represented an aggressive baring of teeth often seen in animals, designed to ward off attacks by enemies. Over many years, however, it has instead come to be used in human social environments to signal the presence of a friend or to signal humour.

Before You Go On

What Do You Know?

8. What counts as ‘inputs’ and ‘outputs’ when we are thinking about human activity?
9. What is meant by a ‘just so’ story in the context of evolutionary explanations? Why are they problematic?
10. Which of the theories presented here depend largely on biological principles?
11. Which of the theories seem to be based more on environmental explanations? And which appear to rely on an interaction of factors?
12. What is cultural universality, and what kinds of psychologists are interested in it?
the practitioner, student or consumer of psychology the challenge is to make sense of this diversity. It is here that psychological literacy is of vital importance. In this book we are showing you how to read psychological research so that you can understand where it is coming from and how it is linked (or not!) to other research and then go on to make informed evaluations of its scope and value. Remember: you may not become a professional psychologist but you will have many people at home, school, work and surgery giving you advice based on psychological theories and research. You need to be able to make your own decisions about its usefulness.

Psychology as a Profession
Many students take a psychology degree because they want to become professional psychologists, such as clinical psychologists, educational psychologists, health psychologists, occupational psychologists, counselling psychologists and sports psychologists. Others want to pursue pure research in an academic environment.

If you wish to make a career of psychology and become a professional psychologist then be aware that an undergraduate degree is just the first step: you will need to undertake postgraduate training, and usually to doctorate level. In the United Kingdom, professional psychologists are chartered members of the British Psychological Society (BPS) and have completed postgraduate programmes approved by the Health & Care Professions Council (HCPC).

In Scandinavia, students need to follow a five- or six-year course leading to a master of science in psychology degree followed by, or including, a stage of internship or practical experience under supervision. After this, they are eligible to apply for registration with the relevant psychological association of their country.

Current Trends in Psychology
The field of psychology is growing more diverse, continuing to profit from technological advances and to give birth to new schools of thought.

Growing Diversity Early in the history of psychology, few women or members of racial minority groups were able to obtain the advanced education and professional status necessary to work in the field. As psychology itself has grown more diverse, however, so have psychologists. Psychology now has more women earning graduate degrees than does any other science. In the United Kingdom, about 85% of undergraduates studying psychology are female.

With growing diversity among psychologists has come increased interest in the diversity of the people they study, treat and influence. Cultural psychology has, for example, become an important area of investigation. As we observed earlier, this field of study seeks to uncover mental processes that exist across all cultures, as well as important cultural differences.

Cultural psychologists often focus on differences between collectivist cultures and individualistic cultures. Members of collectivist cultures emphasize the needs of the group – the community, family or peer group, for example – over the desires of the individual. In contrast, individualistic cultures stress the needs of persons over those of the group. One study of differences between these two types of cultures examined positive emotions, such as happiness. Individuals from Eastern cultures, which tend to be more collectivist, and Western cultures, which tend to be more individualistic, appear to hold different beliefs about the sources of happiness. When asked to talk about events that made them feel happy, Chinese

As she comes closer to graduation, Jasmine, who is taking an undergraduate psychology degree, is beginning to have more and more worries about what she is going to do after university. She is certain that she wants to become a professional psychologist but she is not sure she is particularly interested in clinical work. For one thing, she tends to get irritated when friends assume that just because she is studying psychology she is interested in their problems or has good advice for them.

At first, Jasmine was interested in understanding how issues like race and class influence clinical disorder rates in urban communities. But, as she moved through her studies, she became less interested in these broader social influences and increasingly interested in studying the impact of biological and developmental factors on individual stress levels and on the emergence of psychological problems, particularly in poor communities. Recently, she has been gathering more information about what studying to be a clinical psychologist entails. Still, she is not sure that clinical psychology is the right fit for her. And she is not sure how to go about getting all the answers she is looking for.
research participants focused on interpersonal interactions and evaluations from others. Western participants, in contrast, pointed to personal achievement and self-evaluation (Lu & Shih, 1997).

Even within a broad culture, subcultures may differ with regard to happiness. Studies have shown, for example, that certain levels of positive emotions, such as strong feelings of self-acceptance, are, on average, a bit lower among individuals from southern parts of the United States than among those from the West or Midwest. Some researchers have hypothesized that these lower levels of well-being and self-acceptance may reflect a subculture that is relatively more concerned with showing hospitality and respecting tradition than with fostering positive self-concepts and promoting personal growth (Markus et al., 2004). Given psychology’s growing interest in these and other differences among people and groups, we have included throughout the textbook sections called How We Differ. These sections examine how memory, emotions, social values and the like differ from situation to situation, person to person and group to group.

Advances in Technology As we observed earlier, technological shifts also contribute to shifts in psychological theory. The development of computers in the 1950s and 1960s contributed to the cognitive psychology revolution. Technology has continued to change the face of science and psychology more recently. Innovations such as brain imaging and effective pharmacological, or drug, treatments for mental disorders have revealed a great deal about human mental processes and behaviour. As you will see in Chapter 5, for example, the development of neuroimaging technology has made it possible for researchers to observe activity in the brain directly.

In short, psychology is related to so much in our world that a degree in this discipline can lead to work and careers in more areas and fields than you might imagine. Keep in mind, for example, that the psychologists Daniel Kahneman (2002) and Herbert Simon (1978) are Nobel Laureates in economics, while the neuroscientists Eric Kandel (2000), Rita Levi-Montalcini (1986) and Roger Sperry (1981) won their Nobel Prizes in medicine and physiology.
Since the beginnings of psychology as a science, women have made important discoveries and contributions to it. Here are a few of the field’s female pioneers.

The work of Mary Whiton Calkins (1863–1930) was noteworthy for her emphasis on the self, consciousness, emotions, and dreams, which stood in stark contrast to John Watson’s behaviourist movement at the time. Calkins was the first woman president of the American Psychological Association (APA).

Margaret Floy Washburn (1871–1939) was the first woman to receive a PhD in psychology (1894) and the first woman elected to the National Academy of Sciences (1932). She was one of the earliest experimental psychologists to insist that mental phenomena were as important for scientific study as observable behaviours.

Karen Homey (1885–1952) was one of the most influential early psychoanalytic theorists, a pioneer in the discipline of ‘feminine psychiatry’ and a leader in the Neo-Freudian movement that challenged traditional Freudian views. She was especially critical of Freud’s theory of sexuality.

Leta Hollingworth (1886–1939) was best known for her studies of ‘mentally deficient’ and ‘mentally gifted’ individuals and for her views on gender differences in mental functioning. She was one of the first theorists of her time to challenge the notion that women were biologically inferior, arguing instead that women were victims of a male-dominated social order.

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One important area of psychology that has intersected with other areas for many years is developmental psychology, the study of how we change over the course of our lives. Developmental psychology has both incorporated and contributed to research in areas such as our use of language, our emotions, our personalities and the structure of our brains. We emphasize the intersection between development and other areas by including in most chapters a section called “Develop.”

New Schools of Thought As we saw earlier, historical schools of thought in psychology sow the seeds for related but new ideas. Consider, for example, a relatively new movement called positive psychology. In this movement, we can see influences of both the functionalists, who were interested in applying psychological research, and the humanists, who were interested in helping people achieve their highest potential. Positive psychology gives special attention to more upbeat features of human functioning, including happiness, meaning in life and character strengths. It also focuses on how those features of positive living might be developed more readily.

Happiness seems to have become a buzzword of our times. It has been embraced particularly by the popular media, fueling a self-help industry that claims to give people tools for achieving emotional well-being. Whenever you visit a book store, you can easily see media interest in this area. Happiness has been used, for example, to help market nutritional advice – as in the book The Good Mood Diet: Feel great while you lose weight (Kleiner & Condor, 2007) – and has appeared even in fields not associated primarily with psychology – as in the book The Architecture of Happiness (Botton, 2006).

Positive psychologists have applied the use of scholarly discussion and scientific methods to the study of happiness and other positive variables (Cooper, 2010). Further information on courses in positive psychology can be found at www.positivepsychology.org.uk.

A growing body of research does indeed suggest that positive emotions can have a powerful effect on development and behaviour. As you will see in a later chapter when we discuss stress, coping and health (Chapter 18), a number of studies have found that having a positive outlook promotes resilience, the ability to bounce back in the face of misfortune (Garbarino, 2011). Similarly, studies indicate that positive emotions may boost the functioning of our body’s immune system. Research even suggests that our emotions help influence how well we resist common colds (Cohen et al., 2008, 2003)!

What Changes and What Remains Constant? Since the early years of Greek philosophy, theorists have attempted to explain themselves and other people. Psychologists have asked whether there are universal laws that link mental and physical phenomena. Those questions remain at the forefront of psychology today. Neuroscientists, cultural theorists and other psychologists still try to determine how the mind and body are related, whether there are knowable universal truths about mental processes and human behaviours and whether such truths are best understood by focusing on the brain, the individual or the group, or a particular combination of the three. It is not likely that psychology can ever provide complete answers to these complex questions but we can articulate partial answers by looking at how different levels of analysis can be stitched together to produce a range of interesting theories and research findings.

As you read about these theories and findings throughout this textbook, you will do well to keep asking yourself a question raised by Carl Jung (1875–1961), one of the field’s most famous clinical theorists: ‘How much truth [is] captured by this [particular] viewpoint?’ Ideas move in and out of vogue, and what is accepted today as a useful or accurate outlook may not be seen the same way tomorrow.

Both historical and social forces help determine where scientists focus their energy. Psychology, perhaps more than
any other field, struggles constantly to achieve a proper balance between popular trends and interests, societal influences and scientific objectivity (Leahey, 2000, p. 544). Fads and fashions will likely continue to exert some influence on the field of psychology in the coming years. It is important, though, to recognize that such fads hardly make up the substance of the field. Moreover, we must always keep in mind the limitations of psychology (or of any discipline) in answering the basic questions of human existence. As we noted at the beginning of this chapter, scientific knowledge serves as a means for exploring such questions rather than an end.

**Before You Go On**

**What Do You Know?**
13. What new forms of psychology are in the process of development?
14. What is cultural psychology and how can it help us to explain differences between groups?
15. What is the focus of positive psychology?

**What Do You Think?**
How can psychology influence the way you live your life? Are there any areas of your life you would not like psychologists to explore?

**Summary**

**What Is Psychology?**

**LEARNING OBJECTIVE 1** Give definitions of psychology, and describe the goals and levels of analysis of different approaches to psychological sciences.

- Psychology studies what people do from different perspectives. Psychology as the science of the mind and psychology as the science of behaviour have been the dominant ways of approaching the subject.
- The goals of psychology are to describe, explain, predict and control behaviour and mental processes. Psychologists vary in the degree to which they focus on some of these goals more than others. Some psychologists argue that we also need to study how people understand and develop.
- The study of psychology must occur at multiple levels, including the level of the brain (intra-individual), the level of the person (inter-individual), level of the group (inter-group) and the level of culture (societal).

**Psychology’s Roots in Philosophy**

**LEARNING OBJECTIVE 2** Describe how from the time of the Ancient Greeks to the mid-19th century philosophers and scientists thought about the relationship between mind, body and soul.

- Early explanations of human behaviour were rooted in superstition and magic.
- Theorizing how mind and body were related became a major theme in Western philosophy.
- The work of such early philosophers as Hippocrates, Socrates, Plato and Aristotle contributed to the later formation of psychology as a systematic, empirical science.
- 19th-century physiologists began to investigate the functions of the brain and nervous system.

**The Founding of Psychology**

**LEARNING OBJECTIVE 3** Name important early psychologists and describe the main schools of psychological
theory: introspection, psychoanalysis, functionalism, psychometrics, Gestalt, behaviourism and humanistic.

- The first psychology laboratory was founded in Leipzig, Germany by physiologist/philosopher Wilhelm Wundt. Wundt was interested in human consciousness and will, which he studied by asking trained experimental participants to observe their conscious activity under carefully controlled conditions.
- Wundt distinguished between experimental psychology, which was limited to the study of simple sensory processes, and *Völkerpsychologie*, which studied higher cognitive processes that were the product of cultures, language and history.
- William James established the first psychology laboratory in the United States at Harvard and helped shift the field’s focus to the functions of mental events and behaviours, forming a school of thought known as functionalism.
- Gestalt psychologists, rather than divide consciousness into its smallest parts, studied human tendencies to perceive pattern, putting together the ‘parts’, or individual sensations, to create a ‘whole’ or perception that went beyond the sum of the parts.
- Over the years, different fields of psychology emerged, with different ideas about what was the appropriate area of study for human psychology. Some of the most influential fields were the psychoanalytic, behaviourist, humanistic, cognitive and neuroscience schools of thought.
- Sigmund Freud’s psychoanalytical theory focused on the importance of unconscious mental processes.
- Behaviourists believed strongly that psychology should restrict its focus to the careful study of observable behaviours.
- Francis Galton began the systematic study of individual differences in intelligence and personality.
- Psychometricians focused on measuring individual differences within such areas as intelligence and personality.
- Humanistic psychologists reacted against the mechanical portrayals of people by the behaviourists and emphasized individuals’ potential for growth and self-actualization.

**Psychology in the 21st Century: Cognitive Psychology, Neuroscience and Evolution**

**LEARNING OBJECTIVE 4** Summarize the major principles of the cognitive, psychobiological and neuroscience approaches to psychology.

- Cognitive psychologists reignited interest in the study of mental processes, comparing the workings of the mind to the workings of computers.
- Cognitive psychologists replaced the behaviourist language of stimulus and response with the language of information processing, input, output, hardware and software.
- Experiments by Roger Sperry on people who had undergone surgery that split their brain into two fully independent hemispheres showed how functioning at the psychological level was related to underlying brain organization.
- Sociobiologists such as E. O. Wilson applied the principles of evolution to explain complex social behaviour in terms of adaptation, leading to the development of evolutionary psychology as an emerging field of study.

**The Diversity of Psychology and Psychological Literacy**

**LEARNING OBJECTIVE 5** Describe the major professional branches of psychology and summarize key trends in psychology.

- The theoretical and cultural diversity of the field of psychology has increased dramatically over recent years.
- There are several major branches of professional psychology: clinical, counselling, educational, occupational, sports and exercise, forensic, teaching and research.
- Across these professional areas psychologists are united by their shared values. Psychologists generally agree that psychology is *theory-driven, empirical, multilevel and contextual*.
- Currently, psychology appears to be developing as a science in response to a growing *diversity* throughout the field, advances in *technology* (such as neuroimaging) and the development of relatively new schools such as cultural psychology, cognitive neuroscience, social neuroscience and positive psychology.

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*Quizzes to test yourself further are available in your interactive e-book at www.wileyopenpage.com*
**Key Terms**

<table>
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Flashcards to test yourself further are available in your interactive e-book at [www.wileyopenpage.com](http://www.wileyopenpage.com)