2 HOW PSYCHOLOGY BECAME A SCIENCE

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CHAPTER OUTLINE

INTRODUCTION

2.1 The history of psychology is not a straightforward tale. In fact, history is by no means an exact science: this means that the important stuff is inevitably a matter for interpretation and debate. What follows, therefore, is not *the* history of psychology, but *a* history. It's a history of psychology designed especially to introduce you to the main issues, concepts, people and debates that have helped to shape and define a fascinating and multifaceted discipline.

FRAMING QUESTIONS

How has the discipline of psychology developed? What have been the main stages in its development?
To what extent has psychology developed as a natural science and to what extent as a social science?
How have questions about what *type* of discipline psychology is been related to questions of what it should take as its subject matter?

KEY MOMENTS IN THE EMERGENCE OF MODERN PSYCHOLOGY

2.2 The beginnings of modern psychology are usually traced to the year 1879. That's when **Wilhelm Wundt** (1832–1920) established the first dedicated psychological laboratory at Leipzig. The selection of this date is somewhat arbitrary. Wundt himself had, for example, highlighted the possibility of a distinct psychological discipline as early as 1862 (in his book *Contributions to the theory of sensory perception*). Yet the key events which led Wundt and others to this distinct discipline occurred even earlier.

Such events lie at the very heart of modern science, in the work of such great scientists as Isaac Newton (1642–1727) and Charles Darwin (1809 –1882). Newton's work in physics had a profound influence on psychology. First, he developed a scientific 'method' consisting of observation, the formulation of hypotheses designed to predict events and outcomes, and the subsequent testing of these hypotheses through further observation. In this way, the scientific method worked toward the revelation of ever more general explanatory laws (Cushing, 1998). Such principles remain central to the scientific method that is used in psychology.

Second, and crucially, Newton had great success in applying these methods. He was able to offer an explanation of the entire physical universe based upon a limited number of basic laws (describing a limited number of basic 'forces'), each of which was expressed in a purely mathematical or quantitative form. In principle, it was thought that if you knew

where all the physical bodies in the universe were at time *A*, Newton's laws would allow you to predict their future movements and hence to know (in advance) their respective locations at time *B*. Though this is a simplification, the basic point is that the behaviour of all physical bodies was shown to be lawful and knowledge of the laws appeared to make the subsequent trajectories and relative positions of these bodies entirely predictable. According to this theory, everything behaved in a mechanistic or machine-like fashion because the behaviour of everything was determined by the impact of the same set of basic forces.

Determinism The idea that every event including human thought and behaviour is causally determined by an unbroken chain of prior events. According to this idea there are no mysterious miracles and no random events.

2.2.1 DETERMINISM

This theory of **mechanical determinism** has been a strong influence on psychology. Newton's ideas also impacted on people in general. The pre-Newtonian worldview was characterized by its **anthropocentrism**. That is, people considered themselves to have a central and fundamental place in the universe. Newton's work brought this anthropocentrism into question. The universe was mechanical and its behaviour predetermined: it was 'as it was', regardless of us and our existence. Far from being central, people and their opinions and viewpoints appeared superfluous. The sense of alienation that resulted from this view was the key that opened the door to psychology. Alexander Koyré captures this nicely:

> modern science ... united and unified the universe ... But ... it did this by substituting for our world of quality and sense perception, the world in which we live, and love, and die, another world ... the world of quantity ... a world in which though there is a place for everything, there is no place for man. Thus the world of science – the real world – became estranged and utterly divorced from the world of life. (cited in Prigogine & Stengers, 1984: 35–36)

Anthropocentrism or anthrocentrism The belief that people (*anthro*) are the most important thing in the universe rather than the worthless pile of brown stuff that we really are.

The point here is that Newton and his scientific methods – the modern mind at its best – solved the riddle of the universe, but in so doing produced a dramatic (and tragic) side effect. They appeared to separate us from the universe. Serious questions followed about 'mind' itself, about where humans, and the qualities and perceptions of the everyday human world, fitted in. Our place in the bigger scheme of things was under threat. And, vitally for psychology, this threat made 'us' the next scientific riddle to be solved.

2.2.2 THE RIDDLE OF OUR SELVES

The 'riddle of our selves' became even more pressing following the publication of Darwin's *On the Origin of species* in 1859. As we have seen, Newton had 'decentred' us and lessened

FIGURES 2.1 The riddle of ourselves. On the ceiling of the Sistine Chapel in Rome is a picture that shows one view of where people come from: God reaches out and creates the first man – Adam. Darwin's version would have Adam reaching back to touch his past – a monkey.

our apparent importance. However, at least the principles of mechanical determinism remained and these were widely held to be 'consonant with the generally accepted theological belief in an omnipresent, omniscient God' (Cushing,1998: 168). Newton himself stayed true to the belief that 'the mechanical universe required the active intervention of God, not just to create and order it, but also to maintain it' (1998: 168).

Darwin's theory of evolution by natural selection (see Chapter 1), on the other hand, sat far less comfortably with conventional religious ideas. In fact, it directly challenged them. Human beings, which Christian religion saw as the 'closest thing to God', became the 'nearest thing to apes' in the blink of a scientific eye (Figure 2.1). This was a bitter pill to swallow and one which Sigmund Freud (1856–1939) called 'the second great blow to the human ego' (following the Newtonian blow described earlier). Darwin's theory reignited debates about humans' fundamental nature. It was in the midst of this debate that Wundt's psychological laboratory was founded, just eight years after Darwin's publication of The descent of man (in 1871).

2.2.3 AN IMPORTANT DECISION FOR PSYCHOLOGY

The previous section suggests that psychology emerged in order to solve the 'riddle of our selves'. Thanks to Newton, the discipline also appeared at a time when its most immediate subject matter (the human world of life, quality and sense perception) had been 'estranged and utterly divorced' from the *real* world that Newtonian science had begun to reveal. Our scientific approach has given us answers to many questions about how things work. We know something about how the planets move (the theory of gravity) and we know something about how our senses work (see Chapter 5). What is much more puzzling, however, is our own existence on this world and how we make sense of it. The contrasts in what we know and what we are still puzzling over is shown in Table 2.1.

The word *psychology* means 'a science of mind or soul', and the psychological world (psychology's most immediate subject matter) appears on the right of Table 2.1. It is worth

TABLE 2.1 The big riddles. The universe that Newtonian science dealt with is on the left. The universe it missed out is on the right. Consider the opposing categories carefully. The dualism they represent has been fundamental to psychology and to Western thought and culture more generally

The riddle of the universe	The riddle of our selves
The world of *science*	The world of *life*
The *real* world	The *perceived* world
The *objective* world	The *subjective* world
The world of *quantity*	The world of *quality*
The *physical* world	The *psychological* world
The *somatic* world	The *semantic* world
The world *as it is*?	The world *as it is experienced*?
A science of *matter*	A science of *mind* (and of things *that matter*?)

remembering both these points as we proceed. For the moment, however, psychologists had to decide how best to study this subject matter. Two basic models presented themselves. On the one hand, there was Newton's natural science model which employed quantitative research methods and pursued nomothetic knowledge as a priority (i.e. objective and lawful knowledge which is considered to be generally applicable). This system had triumphed in the physical world.

On the other hand, a social science model was also a possibility. This approach predominated in the humanities and was embodied by the German word *Geisteswissenschaft* (which means 'science of the spirit'). Under this model, the aim was to study humans, human life and human events by re-creating their meaning for the actors involved, in order to find out their *reasons* for doing what they were doing. To achieve this goal, qualitative research methods were generally employed and idiographic knowledge was pursued as a priority (i.e. subjective and specific knowledge of a person, event or situation which reveals that person, event or situation in its uniqueness).

Qualitative data Describe meaning and experience rather than providing numerical values for behaviour such as frequency counts.

Quantitative data Focus on numbers and frequencies rather than on meaning or experience.

This distinction (between the social and natural sciences) was popularised by the historian Wilhelm Dilthey (1833–1911). Dilthey offered clear advice to psychology. First, he acknowledged that humans and human events both possess important physical properties. As an example, your brain is a physical object and its physical properties are going to be pretty important if you want to think. I'm sure you'd realized that (see 'Aside'). This simple observation nonetheless creates a serious complication for psychology, because it means that our status as physical and material 'objects' has a massive effect on our capacity to be

psychological. In other words, in order to fully grasp the psychological world (captured on the right of Table 2.1), the discipline of psychology must also engage with aspects of the physical world (captured on the left of Table 2.1). This latter task demands a natural scientific approach. But whilst psychology cannot avoid our physical or somatic properties (the latter means 'of the body'), Dilthey also warned that:

> explaining human actions is fundamentally different from explaining physical events. A woman shooting a man is a physical event. However, understanding the event in human terms involves more than tracing the path of the bullet and showing how the bullet caused the man's death. We need to know why she shot the man, not just how she did so. (Leahey, 2004: 248)

ASIDE

Had you realized that 'thinking' (biologically speaking) involves the passage of electrical impulses through the nerve cells of the brain and the chemical transmission of those impulses across lots of tiny 'gaps' between the nerve cells called **synapses**? If you were to start counting the synapses now, at a rate of one per second, you would finish in approximately *30 million* years time. The brain is extraordinary. The number of possible pathways available to the brain's electrical impulses (and hence the possibilities for thought) are *greater than the number of atoms in the known universe*.

'Why' questions are central to psychology. The brain, for example, is a good way of explaining *how* we think but not *why* we do it. It doesn't cause us to think, any more than having legs causes us to run. In the same way, any rigorous psychological explanation of running would require, as a matter of precedence, that we understand *why* the running is taking place and not just how it is taking place (the latter presumably involving a series of neuronal signals leading to a more or less rapid movement of the legs).

Dilthey wanted psychology to remember that its primary subject matter was the subjective or psychological world itself, not just the physical properties that made this world possible. Dilthey suggested that if we want to find out 'why', priority must be given to the psychological world – the ways that people make sense of their experience and the meanings they attach to them. In other words, to understand why I am running, you will first need to understand my experience of the current situation and the meanings I assign to it, because only in this way can you find out my motives and reasons for acting. This task demands a social scientific approach.

So what should psychology do? If the psychological world was its proper subject matter, then surely psychology was a humanitarian discipline? For this reason, Dilthey felt a social scientific approach was preferable. But the psychological world can only exist through the physical world. If I don't have a physical body I can't see or hear, for example. Psychology couldn't ignore this either. It needed to study the physical world as well and the natural scientific model dominated in this domain.

This double-edged nature of psychology was (and remains) both a challenge and an opportunity. Psychology had the chance to bridge the divide between the natural and social sciences and it could do so by retaining a foot in both camps (Danziger, 1990). Nomothetic and idiographic knowledge, quantitative and qualitative methods, could all be embraced. It needed to study its subject matter from both perspectives. Wilhelm Wundt tried to support this vision (as did other early psychologists), but it was not a vision that psychology would ultimately sustain. As we're about to see, psychology was intent on becoming a natural science.

Nomothetic and **idiographic** measures omothetic approaches look for laws of behaviour and collect measures that can be observed and verified and quantified. They are concerned with averages and norms. By contrast, idiographic approaches look for unique and individual experiences.

The term 'nomothetic fallacy' refers to the common belief that if you can name a problem then you have solved it. For example, if you feel very upset and someone says you have post-traumatic stress, you still feel upset.

PSYCHOLOGY AS A STUDY OF THE CONSCIOUS MIND: HELMHOLTZ, FECHNER, WUNDT AND A 'NATURAL SCIENCE OF THE MENTAL'

2.3

All things being equal, psychology in the late nineteenth century is probably best categorized as one of the humanities (Windelband, 1894/1998). And the subject matter left to it by the natural sciences – the psychological and inherently subjective world of perception, quality and experience – probably required the application of methods traditionally associated with the social sciences. But all things were not equal. The unprecedented success of the natural science model had a big influence on the emergence of psychology. It also established the view that natural scientific methods were 'the only reliable methods for securing useful and reliable knowledge about anything' (Danziger, 1990: 41). In order to flourish, psychology *had* to align itself with the methods of the natural sciences.

This conclusion was nonetheless complicated by a long-standing philosophical belief that subjective, mental phenomena were not amenable to natural scientific analysis. Immanuel Kant (1724–1804), for example, had rejected the possibility of a 'science of mind' on the grounds that mental phenomena (1) had no spatial dimension, (2) were too transient to observe, and (3) could not be experimentally manipulated in a controlled fashion. Overall, Kant concluded that mental

Reductionism and **materialism** Curt describes reductionism as 'the attempt to reduce or "boil down" any complex phenomenon into the simple elements which are thought to constitute it or cause it' (1994: 241). Philosophically speaking, materialism encapsulates the view that the world/universe is entirely constituted of matter. This view leaves little room for the psychological world. Materialism is sometimes also known as 'physicalism'.

phenomena couldn't be mathematically analysed or described (Fancher, 1996). Such phenomena, he felt, could only ever support a qualitative and philosophical analysis.

To overcome this barrier, psychology exploited the fact that our psychological world is connected to our physical properties. Earlier, we suggested (as a means of explaining Dilthey's arguments) that the brain does not cause us to think. But if the brain doesn't cause us to think, then what does? So psychology went along with the idea that all mental phenomena could, in fact, be explained in terms of physiological causes. This double whammy of **reductionism** and **materialism** reduced the psychological world to a by-product of the physiological properties which produced it. It also neatly sidestepped Kant's objections. As a by-product, subjective mental phenomena were no longer psychology's primary subject matter; physiology was. And natural scientific methods operated very comfortably in this physical domain. As Leahey puts it:

> by insisting that the nervous system is the basis of all mentality, and by defining psychology as the investigation of the physiological conditions of conscious events, the new field could establish itself as a [natural] science. (2004: 235)

But defining psychology in this way was not enough. Establishing psychology as a natural science also demanded that psychological experimentation be carried out in the same way as the natural sciences, and this in turn demanded that psychological phenomena be mathematically measured and described. This was now to involve the 'investigation of the physiological conditions of conscious events' (rather than the events themselves), yet those conditions would still have to be counted and measured.

2.3.1 QUANTIFICATION

The first attempts at counting and measuring in psychology, otherwise known as quantification, were developed by a number of people in a number of different ways. In 1850 Hermann von Helmholtz (1821–1894), an eminent natural scientist, demonstrated that nerve impulses travelled at finite speeds which could be measured in terms of *reaction times*. He did this by passing electric currents through the severed leg of a frog. He also established the psychological principle that human perception (by which he implied the psychological reality we experience) was not a simple replication of the physical reality captured by our senses. Helmholtz proposed instead that sensations were *transformed* into perceptions in a mechanical and lawful fashion by the physiological machinery of our minds.

F.C. Donders (1818–1889) built upon Helmholtz's reaction-time work. Donders realized that the time between the presentation of a stimulus and a person's response to it could be used as a quantifiable measure of the speed of physiological and mental processes (processes which could not otherwise be observed). It was even possible, by making a person choose between two stimuli, to ascertain the exact duration of a mental judgement. This act of quantification (which became known as *mental chronometry*) was exactly what psychology needed if it was to distinguish itself as a natural science.

Gustav Fechner (1801–1887) quantified psychological phenomena in a different way. Like Helmholtz, Fechner had noticed that the information gathered by our senses was

processed and transformed *before* it reaches conscious awareness. In particular, he observed that the perceived intensity of a physical stimulus did not perfectly reflect its physical intensity. A lighted match would, for example, appear to be brighter when it was placed against a dark background. If, Fechner surmised, one could somehow measure the physical *and* the perceived intensity of the stimulus, it might become possible to mathematically determine their relationship (and hence to mathematically connect the psychological and physical worlds).

But how could one measure the perceived intensity? Fechner realized that you couldn't quantify it directly or as an absolute value. What you could do, however, was quantify the smallest *perceptual discrimination* people are capable of making, and you could do this as a function of changes in the physical intensity itself. Let's say, for example, that I put a weight in your right hand and its physical intensity is 100 grams. What is its perceived intensity? There is of course no pure mathematical answer. So suppose I start putting weights into your left hand, one by one – 101 grams, 102, 103 and so on. The question becomes, 'At what weight can you perceive a difference (or discriminate) between the two weights?' And, thanks to Fechner, we know the answer. On average it's when the weight in your left hand is 1/30th (or 3.33 per cent) heavier or lighter than the weight in your right (or, in our example, when the weight in your left hand is 103.33 grams or more). Fechner called this perceived change in intensity a 'just noticeable difference' (or JND) and it constituted a quantitative measure of perceived intensity.

EXERCISE: sensation and perception

Take a box of matches. Light one of the matches and hold it up in front of a light background. How bright does it look? Try and put a number on your judgement of brightness (your perception). Now light another match in front of a different coloured background. How bright does that look?

The amount of light from the two matches will be the same (sensation) but your judgement might well be different. Try this out with a number of backgrounds and explore the factors that change your perception. By the way, try not to burn down your house during this study.

Fechner was able to measure the JND across a range of sensory functions and to graphically represent the relationship between physical and perceived stimulus intensities in each case. He also demonstrated that the relationship between physical and perceived intensity could *always* be expressed via a single mathematical formula. In truth this law was anything but perfect. Nonetheless, Fechner's psychophysical experiments had clearly shown that: (1) the content of the psychological world could be manipulated by controlling the stimuli presented to it; (2) whilst such content might actually represent a subjective 'distortion' of the physical world, such distortion was nevertheless carried out (by our physiology) in a mechanical and lawful fashion; and (3) as a result, the content of the

psychological world could be shown to have a lawful and quantifiable relationship with the content of the physical world.

Other important work on counting and measuring psychological qualities was occurring at roughly the same time. Perhaps the most notable was the development of mental and intelligence testing procedures, via the work of Francis Galton (1822–1911) in Britain, Alfred Binet (1857–1911) in France (see Chapter 17) and America, and latterly William Stern (1871–1938) in Germany. The truth is then that the new discipline's desire to become a 'natural science of the mental' was already well established before Wundt's laboratory ever appeared.

Wundt had indeed called his first taught course in psychology 'Psychology as a natural science' (in 1862), and both mental chronometry and Fechner-like experiments quickly characterized the work of Wundt's laboratory at Leipzig. Yet, in common with most German academics, Wundt remained a strong advocate of the distinction between the *Natur-* and *Geisteswissenschaften* (natural and social sciences) and his general approach recognized that psychology stood at the point of transition between the two. This is not surprising because Wundt had been employed at Leipzig to teach philosophy and to teach psychology as a part of that humanitarian discipline (Leahey, 2004). His methodological approach duly combined the new methods of quantification described above with a more traditional method called *introspection*, which had been employed by the 'old-fashioned philosophical psychology … to reveal the contents and workings of the mind' (2004: 237).

2.3.2 THE INTROSPECTIVE METHOD

In 1873, Wundt's *Principles of physiological psychology* described the emerging discipline of psychology. It combined physiology, which 'informs us about those life phenomena that we perceive by our external senses', with a psychological and introspective approach in which 'the person looks upon himself from within' (1873: 157). The introspective method, which relied on a process of self-report about the 'goings-on' in one's psychological world, had previously been dismissed by scientists and philosophers alike because of its unreliability and inherent subjectivity. Wundt himself doubted its effectiveness. He had responded, however, by trying to transform this unreliable act of internal perception into something akin to scientific observation (Danziger, 1990).

To do this, Wundt restricted his so-called physiological psychology to the study of processes that were simultaneously accessible to both internal and external acts of observation. In practice, a stimulus was presented to a participant and quantified response measures were gathered at the same time as subjective reports of the conscious content elicited by the stimulus (Figure 2.2). In this way, the introspective data always appeared alongside the more important objective measures. In order to control the style of the introspective reports they were only collected from trained researchers. This move was clever in as much as it gave introspection a new status as a special skill. Only a trained scientist could carry out these scientific observations with sufficient reliability. Despite this, the qualitative data introspection produced were still not accepted as a basis for knowledge claims. Only quantitative data could do that.

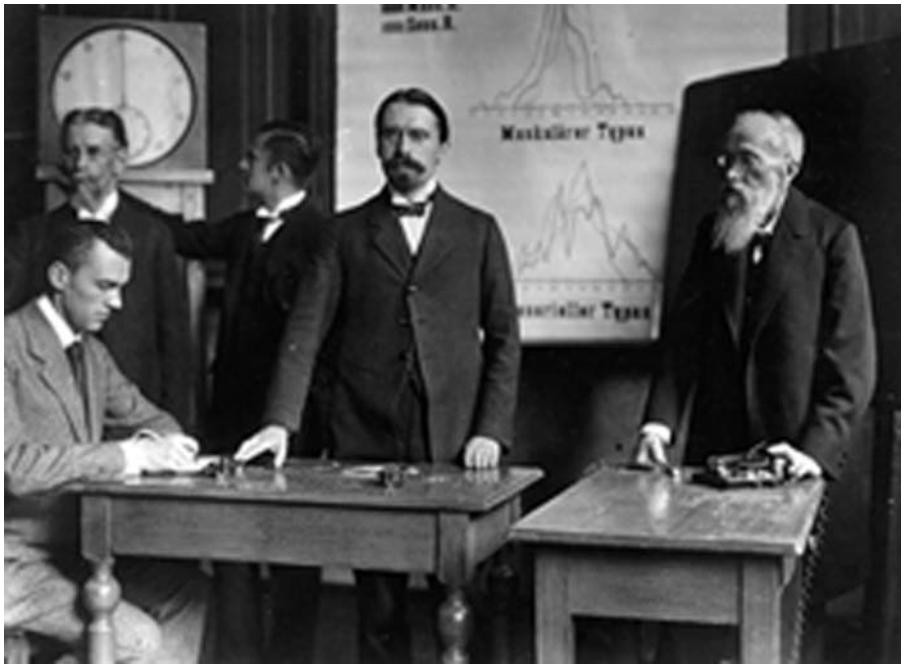

FIGURE 2.2 Wundt (right) in his laboratory in Leipzig: the team are shown taking part in a joke telling experiment.

These many restrictions limited Wundt to the study of psychological processes on the edge of conscious experience: basically, sensation, perception and motor responses. But this did not concern Wundt, for he considered these to be the only processes properly accessible to natural scientific analysis and the only ones directly and mechanistically caused by physiological processes. Higher-order mental processes (complex thought, memory, voluntary effort, creativity etc.) were, for Wundt, part of a distinct psychic causality, and they were caused, not by physiology, but by an underlying layer of unconscious psychological mechanisms. These mechanisms were said to be qualitative in nature and for this reason Wundt felt they would always resist experimental or natural scientific analysis. Non-experimental approaches would also be required.

Wundt spent the last 20 years of his life developing his *Völkerpsychologie*, that is a kind of historical and comparative psychology which looked at people as part of a collective and which tried to understand them within their social, cultural and communal context. Wundt believed these historical, qualitative and distinctly social scientific analyses were a very necessary addition to experimental studies of individual people in the laboratory. He felt strongly that the 'experimental method plus *Völkerpsychologie* would furnish a complete, albeit not completely natural-scientific, psychology' (Leahey, 2004: 239).

Few agreed: Wundt's desire for psychology to retain links with the humanities was at odds with the prevailing vision. Psychology wanted to be a natural science. Completely. Hermann

Ebbinghaus (1850–1909) had already demonstrated (in 1879) that the higher-order mental process of memory could potentially be made accessible to experiment (Fancher, 1996) and Wundt's influence was waning. He died in 1920 along with many of his ideas.

Introspection, meanwhile, was to flourish in the work of two of Wundt's students, Oswald Külpe (1862–1915) and Edward Titchener (1867–1927). Both the 'Würzburg School' of systematic introspection established by Külpe and Titchener's 'structural psychology' relieved introspection of its restrictions. Memory, thinking and complex feelings became legitimate topics for introspective analysis and the resulting qualitative data took centre stage. Titchener described these changes in 1912:

> The experimenter of the early nineties trusted, first of all, in his instruments ... [which were] of more importance than the observer ... There were still vast reaches of mental life which experiment had not touched ... Now ... we have changed all that. The movement towards qualitative analysis has culminated in what is called ... the method of 'systematic experimental introspection'. (cited in Danziger, 1990: 43)

Yet this was ultimately a backward step. Simply calling introspection 'systematic' and 'experimental' could not hide the fact that psychology's subject matter had once again drawn the discipline away from the natural sciences and back toward the humanities. As Titchener's experimental psychology explored the 'vast reaches of mental life', so a qualitative analysis along the lines of the old philosophical psychology had reappeared. The first attempts to establish a natural science of the mental had reached a dead end. Alternatives were required.

TWO ALTERNATIVE WAYS OF FOUNDING PSYCHOLOGY: SIGMUND FREUD AND THE UNCONSCIOUS, WILLIAM JAMES AND FUNCTIONALISM

2.4

In truth, the work of Sigmund Freud is something of a distraction in a chapter about psychological science. Had Freud's work developed differently, this might not have been the case: when in 1894/5 Freud was writing his *Project for a scientific psychology* he 'defined his Newtonian "intention … to furnish a psychology that shall be a natural science: that is, to represent psychical processes as quantitatively determinate states of specifiable material particles"' (cited in Leahey, 2004: 267). This statement, early in Freud's work, was reminiscent of Wundt's view. Yet Freud was to depart dramatically from these intentions.

Freud's work in psychology began with an interest in **hysteria**, a complaint in which physical symptoms appeared in the absence of any obvious physical cause, and his psychoanalytic approach emerged as a therapy to deal with this problem. He believed the physical symptoms were caused by unconscious (and potentially damaging) psychological memories, needs or desires, as they made themselves manifest in the hysteric's behaviour.

Psychoanalysis itself was a 'talking cure' in which patients voiced their problems and feelings under the guidance of a therapist, with the aim of bringing the hitherto unconscious desires into conscious awareness.

ASIDE

Hysteria is a condition in which physical symptoms appear in the absence of any obvious physical cause.

Today, hysteria would be called a dissociative disorder. In Freud's time, only women were thought to be hysterical. Nice. This is a prime example of the masculine bias which has long afflicted psychology.

In fact, Freud initially proposed (*very* controversially) that all hysterics had suffered sexual abuse in childhood. He later retracted this 'seduction theory' of hysteria. He nonetheless retained the belief that many of the hysteric's 'potentially damaging' ideas and desires were of a sexual nature and that much of *everybody's* behaviour was driven by the repression of such sexual desires.

On the basis of just six case studies of psychoanalytic therapy (of which only two were claimed as successes) and a process of self-analysis, Freud came to the conclusion that all human behaviour was caused by psychological drives and events occurring in the unconscious mind (and were of a primarily sexual and pleasure-seeking nature). In non-hysterics, Freud saw dreams as the primary means of uncovering and interpreting this unconscious content (and he regarded his 1900 publication *The interpretation of dreams* as his master work).

Freud undoubtedly wanted psychoanalysis to be a science. Yet most of his claims about the nature and influence of the unconscious mind have never been substantiated by scientific evidence. He did not try 'to create an experimental psychology of the unconscious, nor did he welcome attempts to scientifically verify his ideas' (Leahey, 2004: 265). As a result, Freud's ideas have generally been vilified by a psychological discipline intent on emulating the natural sciences (Eysenck, 2004).

It is nonetheless important to acknowledge the huge popularity of psychoanalysis. Freud's ideas and concepts have also greatly influenced 'contemporary ways of thinking about human feelings and conduct' (Gay, 1989: xii). It may not be science, but Freud's conceptual scheme clearly remains a compelling means of reading and interpreting human behaviour. Psychology was also affected by Freud in two further ways. First, his ideas led the way into abnormal psychology (and studies of mental health); and second, they showed that psychology was not just an academic discipline, but also an *applied* and therapeutic one. The psychologist could be a scientist and/or the practitioner.

2.4.1 AND IN THE USA

This tension between academic and applied psychology was first noted by William James (1842–1910). James was to American psychology what Wundt had been in Europe: a

founding father for the new discipline. He was initially impressed by the work of Wundt and the German physiological psychologists. The mechanical, causal explanations they offered and the idea that psychology might be based upon natural scientific principles excited him intellectually. On the other hand, he found its implications quite distressing from a spiritual perspective. And you can see his point. Are we really so mechanical and predictable? Are we really so controlled by our physiology? For James, such explanations left little room for the expression of human choice, creativity, and free will.

James's resolution of this personal conflict is ultimately central to understanding his later work. He decided that it was useful to accept mechanistic explanations in a scientific context. He even accepted that psychology had little choice but to progress in this direction. But this didn't mean he had to think and behave in a predictable and determined fashion. In this personal context, he would live creatively and with free will. This course of action, which rested on the principle that an idea may be true or have utility only in a specific context, was to become a central feature of James's later career in philosophy.

This personal accent on free will and his ultimate preference for philosophy also hint at James's subsequent attitude to psychology. In his much acclaimed *Principles of psychology* (1890), James strongly criticized the experimental and structural approach to psychology he associated with Wundt and Titchener. This approach was, for James, both very reductive and a bore! Its pursuit of basic mental structures or elements involved a wholly artificial and barbaric dissection of mental life. In contrast, James emphasized the continuous, indivisible and ever-changing nature of mental life via his concept of the stream of consciousness. He saw consciousness as both selective and functional. It was selective in so far as it evolved in order to help people choose (between various courses of action) and it was functional in as much as these choices were vital in helping the individual adapt to their environment.

EXERCISE Do you have free will?

The free will versus determinism debate remains a key argument for psychologists. Is our behaviour determined by physiology, unconscious forces or even environmental influences? Or are we free to act according to our own free will? It's a tricky one, but in everyday life we tend to fall down on the free will side of the debate.

Try this one out on family and friends. Try using determinist arguments to get yourself out of tricky situations like crashing your mum's car. For example, try saying 'I couldn't help myself, I was born that way', or 'I was just responding to the flux of neurochemicals washing around my brain. 'If you get a response that is anything other than a two-word sentence where the second word is 'off', then let us know. That's how much people believe in determinism.

European psychology had founded itself on the principles of Newtonian science and this allegiance created a focus on mental structures and underlying explanatory mechanisms. James's emphasis on the functional and adaptive significance of consciousness

demonstrates the alternative but 'powerful influence of Darwin on early U.S. scientific psychology' (Hergenhahn, 2005: 313). From around 1900, American psychology steadily moved away 'from the traditional psychology of conscious content … toward a psychology of mental adjustment inspired by evolutionary theory' (Leahey, 2004: 341–342).

This movement inspired important changes in the view of psychology and its subject matter. First, the conscious mind came to be understood as just another biological adaptation. It existed because it served an evolutionary function, and that function was to enable people to adapt their behaviour in relation to their current circumstances. Given this association of mind with biology, it is not surprising to find that mind and body, and particularly mind and behaviour, were increasingly viewed as inseparable and synonymous entities. Mind was an 'outgrowth of conduct, a superior and more direct means of adjusting the organism to the environment' (Bolton, 1902, cited in Leahey, 2004: 343). In a very real sense, mind *became* action.

This theoretical shift initially showed itself in renewed attempts by psychologists to make psychology useful in an applied and therapeutic way. Psychology, it was felt, had to have a practical *function*. And it could achieve this by bringing about improvements in education and learning, by intervening in matters of abnormal psychology (now increasingly defined as maladaptive behaviour), and by bringing about human and societal betterment through these interventions. If mind involved mental adjustment, psychology could help us adjust more profitably. The Great War (1914–1918), so damaging in so many ways, actually gave applied psychology a tremendous boost. The mental testing procedures of Galton and Binet, exploited most famously in America by James McKeen Cattell (1860–1944), thrived in this sort of applied environment. And they have done so ever since. These methods have formed the basis of an individual differences tradition in psychology. Section F in this text will tell you all you need to know.

But this applied success, whilst welcome, still failed to satisfy the natural scientific and experimental ideal that the academic discipline held so dear. This needed to be remedied. If mind *is* action, the argument went, then a person's psychological world was freely observable and accessible in the physical world by simple reference to what they do. Experimental psychology was about to start a new life, most 'satisfactorily defined as the science of human behaviour' (Pillsbury, 1911: 1).

CONDITIONING: WATSON, PAVLOV, SKINNER AND THE STUDY OF BEHAVIOUR

2.5

In 1913, John B. Watson (1878–1958) laid out an aggressive manifesto for this science of human behaviour in a paper entitled 'Psychology as the behaviourist views it':

> Psychology as the behaviourist views it is a purely objective branch of natural science. Its goal is the prediction and control of behaviour. Introspection forms no essential part of its methods, nor is the scientific value of its data dependent on the readiness with which they lend themselves to interpretation in terms of consciousness. The behaviourist recognizes no dividing line between man and brute. (1913: 158)

This all seems quite straightforward. Introspection had reached a scientific impasse and the functionalists had begun to see mind as synonymous with behaviour. As one might predict, therefore, Watson's rejection of introspection caused little argument. Watson's technology of behaviour also set out to ignore the facts of consciousness, and for this reason even Titchener (the undisputed champion of introspection) did not see it as competition. It just wasn't psychology. Yet most psychologists trained in the ways of functionalism were quite happy to accept a form of methodological behaviourism which allowed them to acknowledge the presence of conscious experience, but also to ignore it as something hopelessly unsuited to scientific analyses.

But behind Watson's words lay radical change. He strongly advocated a strict or radical behaviourism in which the very existence of consciousness was brought into question. Psychology, he proposed, should henceforth 'discard all reference to consciousness'.

The use of mentalistic terminology such as 'the mind' or 'consciousness' did indeed become more and more problematic for psychologists over the next decade or so. For the strict behaviourist, consciousness had no place in the discipline or in human life more generally. Behavioural adaptation was not a function of consciousness; it was instead a function of our capacity to learn (Figure 2.3).

This principle had already been demonstrated by Edward Thorndike (1874–1949) and perhaps more famously by Ivan Pavlov (1849–1936). Pavlov received a Nobel Prize for work which exploited the (delightful) fact that dogs salivate at the merest expectation of food. Pavlov demonstrated, by repeatedly pairing a particular stimulus (the food) with a sound (famously a bell but more probably a metronome), that his dogs would eventually salivate in response to the sound alone. They had, in other words, learned to connect the food (known as the unconditioned stimulus) with the sound (or conditioned stimulus). This form of learning, in which new stimulus–response connections were created, became known as classical conditioning. Thorndike, on the other hand, showed through a series of clever 'puzzle box' experiments that animals could be trained to produce a specific behavioural response more frequently if that response elicited a tangible reward. This form of learning, which could be used to strengthen (or weaken) pre-existing response tendencies, became known as operant conditioning.

2.5.1 MAN AND BRUTE

These animal studies nonetheless became directly applicable to psychology only when Watson, in true Darwinian style, forcefully pointed out that 'man and brute' were no longer seen as divided. Watson argued that, because we are animals, so the study of other, simpler, animals could shed light on the way humans function. Following this emphasis on learning, Watson was also able to argue that 'instinct' was another concept that psychology could do without. We began life as a blank slate (with no personality, no intelligence – just a mental blank canvas) and everything we subsequently did, all our knowledge and skills, was the result of processes of learning or deliberate training. And the latter, the training and ultimate control of behaviour, was now the central aim of the psychologist. As Watson (1930) put it, we 'can build any man, starting at birth, into any kind of social or a-social being upon order' (cited in Leahey, 2004: 377).

Behaviourism reached its height between 1930 and 1950 and is now most prominently associated with the work of B.F. Skinner (1904–1990). Skinner developed Thorndike's ideas. Using similar apparatus he focused on *contingencies of reinforcement*: in other words, the nature and specific patterns of reward-giving through which spontaneously emitted and random behaviours (or operants) could best be 'shaped' into direct, learned (or conditioned) responses. Theoretically, Skinner shared Watson's radical behaviourism: he stressed the determining influence of environmental influences on behaviour, whilst excluding all reference to mental states (Hergenhahn, 2005).

In two philosophical publications (*Walden two* published in 1948, and *Beyond freedom and dignity* in 1971), Skinner also explored the ultimate behaviourist vision of a utopian society in which people 'were conditioned into socially admirable ways of acting' (Harré, 2006: 18). In this brave new world, people would be rewarded for good behaviour and the society would be ordered, productive and calm. Crime would be low and happiness would be everywhere. It's easy to mock this ambition, but if we could create a better and happier world by engineering the rewards that people got for their behaviour, then at first glance this might appear to be a good idea. Further reflection however reveals a serious flaw with this ambition in that someone has to decide what constitutes a 'better' or 'happier' world and also what behaviours are worthy of reward. We could end up with a Ministry of Happiness run by psychologists in a world with no dissent and no challenge to authority.

Skinner and behaviourism were both enormously important. Skinner was voted the most influential psychologist of the twentieth century (Dittman, 2002). The methodological approach associated with behaviourism, which promoted 'a causal metaphysics, an experimental methodology based upon independent and dependent variables applied to a population and the use of statistics as the main analytical tool', is still used by the discipline as *the* benchmark for 'what a scientific psychology should be' (Harré, 2006: 8). The classes in research methods that you attend will no doubt confirm that this methodology is still very much alive and well in psychology.

Eventually, however, the influence of behaviourism itself began to give way. In Europe in particular, work in a more traditional psychological vein (with a focus on active mental processes) had continued throughout the period of behaviourist domination. Frederic Bartlett's (1886–1969) work on *Remembering* (1932) and Jean Piaget's (1896–1980) approach to cognitive development are good examples, as is the work of the **Gestalt psychologists**. Even in the midst of American behaviourism, influential theorists like Edward Chace Tolman (1886–1959) and Clark Leonard Hull (1884–1952) also promoted the idea that mental processes played a fundamental role in the determination of behaviour. Both acknowledged these processes as 'intervening variables' (so called because they intervened between the stimulus and response) in their respective behaviourist theories.

In the end, the demise of behaviourism was almost inevitable. It had always been problematic to draw conclusions about humans on the basis of animal studies. Animals often behaved in an apparently mindless fashion, but this needn't mean that humans were similarly without minds. The image of humans as pawns in the environment also seemed unnecessarily negative. It is a depressing view of humanity if we think of ourselves as being puppets that are manipulated by changes in our environment.

The most damning indictment of behaviourism was nonetheless painfully straightforward: it wasn't psychology. Psychology, after all, means the study of mind, so abandoning that concept really did create a problem and limit the areas that psychology could investigate. We have seen throughout this chapter that psychology has tended (for mainly methodological reasons) to sidestep what may be its key subject matter: the subjective world of mental phenomena. But behaviourism took this avoidance to its logical conclusion. In the final section we will briefly consider modern attempts to put this right.

MODERN PSYCHOLOGY: COGNITIVE SCIENCE, HUMANISM AND THE RETURN OF THE SOCIAL SCIENCES

2.6 In the middle of the last century behaviourism ran out of steam, and it became obvious that we needed to look at the thought processes that intervene between stimulus and response. It was no longer enough to see us as puppets just responding to whatever stimulus came our way. Cognitive science (the study of mental processes) took over from behaviourism as the dominant paradigm in psychology around 1960 and it remains dominant to this day. A benefit of this is that cognitive science's tendency to exploit the behaviourist experimental model, combined with a focus on information processing, has made psychology look like a 'natural science of the mental' once again. It has made a significant contribution to the discipline's progress in recent years (the cognitive approach is dealt with in Section B).

On the downside, many psychologists would argue that cognitive science has again avoided the psychological world of subjective, mental phenomena in order to study a whole host of supposedly more permanent mental and causal structures which are said to lie beneath. These structures have various names – traits, attitudes, schemas, personalities, and so on: the list is very long. And unlike the subjective, mental phenomena themselves, these entities are hypothesized to have an enduring existence, to be experimentally manipulable in a controlled fashion, and hence to possess a substance which allows mathematical analysis and description. The problem is that nobody has ever proved their existence. Harré launches a critique along precisely these lines:

> People, for the purposes of psychology, are not internally complex. They have no parts ... There are no mental states other than the private thoughts and feelings people are aware of from time to time. There are no mental mechanisms by which a person's powers and skills are implemented, except the occasional private rehearsals for action in which we sometimes engage. The whole top heavy apparatus of ... cognitive psychology is at worst a fantasy and at best a metaphor. (1998: 15)

A related critique focuses on methods. Clearly, natural science has progressed a long way since Newton; yet despite its long-held desire to emulate these disciplines, psychology has not moved with it (Harré, 1999). The experimental methodology based upon independent

and dependent variables we described earlier is, in truth, an invention of psychology (Harré, 2006) which is not properly reflective of any natural science model.

Psychologists are nonetheless resourceful creatures and two distinct responses to this situation are now discernible. The experimental and quantitative tradition in psychology has, for example, developed a number of statistics and techniques which are closely related to modern developments in physics and chemistry (Gelman & Hill, 2007). Huge advances in both structural and functional brain scanning technology have also allowed *cognitive neuroscience* to link subjective mental phenomena to brain function (and physiology) in ways that would have amazed Wundt and James (Frith, 2007).

A second response has involved the re-emergence of more 'humanitarian' values and methods within psychology. This began with the **humanist** movement in the 1960s, which offered itself as a 'third force' in psychology. It aimed to provide an antidote to the negativity which seemed to characterize behaviourism and Freudian psychoanalysis. Most associated with Abraham Maslow (1908–1970) and Carl Rogers (1902–1987), humanism suggested that the subjective mental phenomena (or 'reality') which psychology had so often ignored were actually the primary guide for human behaviour. Behaviour was not *caused*: rather, it was motivated by each individual's desire to *self-actualise* and reach their full potential. Humanism stalled, however, primarily because it failed to come up with a method of collecting data about people and ultimately because its uncritical and positive assessment of humans felt more like a form of wishful thinking than a serious scientific endeavour.

In the last 30 years, the social scientific model has nonetheless returned to psychology in a more rigorous fashion. To a large extent, this movement continues to be inspired by suspicions that natural science may be inappropriate as a model for psychology. There is a renewed belief that the subjective world of meaningful human experience (look at Table 2.1 again!) really *is* psychology's rightful subject matter. And a proliferation of qualitative research methods has duly emerged to interrogate particular aspects of this extraordinarily diverse, and very human, world of life (see Willig & Stainton Rogers, 2007).

CONCLUSION

2.7 This is an exciting time to be studying psychology. As we've just discussed, the natural and social scientific models are showing marked signs of convergence. Psychologists are connecting human meaning-making and creativity to brain function in ever greater detail (Edelman, 2006). Psychology is now armed with a range of quantitative and qualitative methods, as well as some very advanced technologies, which all satisfy the scientific ideal (in a range of different ways). Research which deliberately 'mixes' methods traditionally associated with the natural and social sciences has also become very fashionable (Creswell & Plano Clark, 2007). Psychology finally seems to be accepting its position at the divide between the natural and social sciences, and acknowledging that to take full advantage of this position it really *has to* retain a foot in both these (increasingly connected) camps. Now comes your chance to contribute …

CHAPTER SUMMARY

2.8 As we have seen, modern psychology traces its immediate origins to the late nineteenth century, when Wilhelm Wundt created his laboratory in Leipzig. Since that time, the discipline has moved to and fro between conceptions of psychology as (1) a natural science and (2) a social science. Much has hinged on the question of focus: to what extent should psychology study the mind and our experiences of the world, and to what extent should it focus on what is externally observable and measurable? Over the past 150 years psychology has developed a range of methods, approaches and measures, yet the central questions remain.

DISCUSSION QUESTIONS

As we have seen, psychology has developed through debate between those who believe the discipline should be modelled on natural science, and those who believe it should be modelled on social science. What arguments can you see for and against each of these positions? Where do you stand yourself on this debate?

What are the implications of the two views above for (1) what topics or phenomena should be studied; (2) the methods that should be used?

SUGGESTIONS FOR FURTHER READING

One of the best texts to pick up to explore the beginnings of psychology is Fancher, R.E. (1996). *Pioneers of psychology* (3rd edn). New York: Norton. This looks at key ideas and key people chapter by chapter, and the book provides very useful background to several other chapters in this text.

Another text that has stood the test of time is Miller, G. (1966). *Psychology: the science of mental life*. London: Penguin. This also covers the pioneers of psychology with some interesting insights into their lives and ideas.

If you want a comprehensive account, there are a number of large texts designed for US courses on the history of psychology: for example, Benjamin, L.T. (1996). *A history of psychology*. New York: McGraw-Hill.

There is also a readable text written for the UK market: Jones, D., & Elcock, J. (2001). *History and theories of psychology: a critical perspective*. London: Arnold.