

# Wilhelm Wundt and the emergence of scientific psychology

## Geoff Bunn looks at the gap between what Wundt hoped for psychology and what actually came to pass

‘I am prepared to say that Wundt is the founder, not of experimental psychology alone, but of psychology.’  
Edward B. Titchener (1921)

‘Virtually everything that happened in modern psychology was a repudiation of Wundt.’  
Kurt Danziger (1990)

In the mid-nineteenth century, psychology did not exist as a formal academic discipline. Admittedly a few independently wealthy Victorian ‘men of science’, such as Francis Galton and Herbert Spencer, had started to collect statistics on individual abilities and construct elaborate theories of human nature. However there were, as yet, no degree courses, academic journals or research laboratories devoted to psychology.

Then, in 1867, the revered American philosopher William James announced that ‘perhaps the time has come for psychology to begin to be a science. Some measurements have already been made in the region lying between the physical changes in the nerves and the appearance of consciousness,’ he explained, ‘and more may come of it... Helmholtz and a man named Wundt at Heidelberg are working on it.’ A challenge had been laid down.

### The father of experimental psychology

The ‘man named Wundt’ was Wilhelm Maximilian Wundt, a conscientious physician and one-time politician who had been born in Mannheim in 1832 to religious parents. Wundt was still a relatively obscure assistant professor of physiology in 1867, although he had already taught the first university course in psychology and had published his *Lectures on the Mind of Humans and Animals*. In 1872 Wundt informed his fiancée that he

intended to take up James’ provocative call-to-arms and devote himself to the ‘somewhat suspect borderland between physiology and philosophy’. He dedicated the last half of his life to this field, and subsequently became known as ‘the father of experimental psychology’.

Wundt’s claims to this title are impressive. His *Principles of Physiological Psychology* (1874) was psychology’s first textbook. He opened the first laboratory to be exclusively devoted to psychological experimentation at the University of Leipzig in 1879, the event that has been taken to mark the birth of psychology as an independent discipline. In 1883 he launched an academic journal, *Philosophical Studies*, to publish the Leipzig school’s research.

### Where are the discoveries?

But there is an irony at the heart of Wundt’s reputation as the devoted father to a newborn science: he had no desire to bring a new discipline of psychology into the world at all. His principle goal, in fact, was to revitalise philosophy using physiological methods to produce data about the human

### Signposts



history of psychology, introspection

mind's capabilities. Furthermore he did not leave an enduring legacy of either empirical discoveries or theoretical principles, despite his legendary productivity.

Wundt's first American student, G. Stanley Hall, wrote:

It does not seem to me that he made any epoch-making contributions to psychology, although he will always fill a large place as the first to establish this science on an experimental basis. (Baldwin 1921)

We are therefore left with a disconcerting puzzle: the methods that apparently established psychology's scientific credentials did not generate any discoveries that have stood the test of time.

### Lessons from early psychology

So why should Wundt's story interest us today? I believe the answer is that it tells us a lot about what happens when psychology attempts to travel across cultural boundaries. Psychology is highly sensitive to its social context because it is both a science and an art. It strives for the objectivity of numbers, yet also craves the subjectivity of meaning. Some of the categories it studies are real things that can be measured because they have a basis in physiology (neurons, genes, hormones, sex). But some of its categories are not things at all and cannot be measured because they have come down to us from philosophy (neurosis, personality, race, gender).

Wundt was right that psychology exists on a 'somewhat suspect borderland' between the two aspects of physiology and philosophy. These two aspects to his vision for psychology each look in a different direction across that borderland.

### Rigorous methods and a clockwork life

Like any strict father figure, Wundt had strong opinions on what he considered best for his offspring. At the start of each academic year, new students were obliged to stand in line while Wundt assigned each one a research topic. Anyone who plucked up the courage had to

wait for His Excellency to pass from the laboratory down the corridor to his lecture room. Disappointed ones were directed to take up their position at a certain place on Thomas Ring Street which he was known to pass daily with clocklike regularity (Kusch 1995)

Titchener, who was one of Wundt's students in the early 1890s, reckoned that Wundt

whatever his intellectual gifts, could not have compassed this bulk of scientific work had he not been dowered with a good physical constitution and had he not lived a strictly regulated life. His days passed, in fact, with the regularity of clockwork (Baldwin 1921).

Accurate time-keeping was both a personal value for Wundt and the basis of his scientific practice. His insistence on exact measurement was made possible by restricting the scope of psychological investigation to those topics that could be legitimately investigated in the laboratory. Seventy percent of his graduate students were therefore assigned fundamental topics of sensation or perception such as vision, touch or taste. The rest worked on memory, attention or methodology. It was a precise vision for a new science.

### Measurement and psychophysics

Time was also Wundt's royal road towards a scientific model of the human mind. He relied on the skills of clock makers to construct the delicate instruments his methods demanded. Matthäus Hipp's chronoscope (1840) for example, an instrument that often featured in photographs of Wundt's laboratory, was theoretically capable of recording intervals of 1/1000th of a second.

The Leipzig group used the chronoscope to measure 'reaction time', the time it took for a subject to respond to a stimulus. A credible new science should be able to produce exact measurements, as another one of Wundt's American students, James McKeen Cattell (1890), explained:

As Experimental Physics is devoted to the measurement of time, space and mass in the material world, so Experimental Psychology may measure time, complexity and intensity in consciousness.

All the 'subject' had to do in a typical psychophysics experiment was press a switch when he heard the sound of a falling pellet hit a metal plate. The chronoscope started when the pellet struck the plate and it stopped when the subject heard the strike and released the switch. The instrument therefore measured the time elapsed between the stimulus and the response. A typical reaction time lasted around 300 milliseconds.

### Introspection

Wundt went on to develop another procedure: introspection. This technique involved the perception of a sensory event and then reporting on the phenomenological experience of the event. This procedure sounds simple. However in practice it was extremely tricky to get right. Firstly, of course, there were large variations in reaction times between subjects. Perceiving a sensory event and then reporting on the phenomenological experience of the event were not straightforward matters. Experimental subjects had to be knowledgeable about the purpose of the experiment and adopt the right 'mental set' to perceive stimuli correctly. They effectively had to know how to produce the kind of data Wundt wanted.

As both experimenter and subject had to be experts on experimental protocol, their roles were therefore interchangeable. As a result, only a few experimenter-subjects needed to be trained in the art of introspection, because the aim was to discover the workings of the generalised human mind that everyone was assumed to share.

According to Wundt, introspection was not about ruminating on one's own feelings or emotions, in the manner of a poet or philosopher. On the contrary, introspection was a highly controlled process — a systematic method used to study the mind by breaking up conscious awareness into basic structures of thoughts, images and sensations. Focusing too much on one's mental state could compromise the experiment. In practice, introspective reports tended to consist of simple judgments of the size, intensity and duration of physical stimuli, occasionally supplemented by judgments of the simultaneity and succession of stimuli. Wundt's ambition to construct a theory of the human mind began with this simple technique of 'mental chronometry'.

### Perception and apperception

Wundt knew that experimental methods were only useful for investigating the most elementary psychological processes. In his theory, he distinguished between *perception* on the one hand, and what he called *apperception* on the other. Stimuli outside awareness are merely *perceived*, he said, whereas stimuli receiving attention are *apperceived*.

Apperception was therefore affected by 'higher level' psychological processes such as motives, innate tendencies, memory and so on. Higher mental processes such as emotion

and language were not readily amenable to experimental investigation and could not be reliably studied using introspection and mental chronometry. This was because they were irreducibly historical phenomena, as Wundt (1916) explained:

Individual consciousness is wholly incapable of giving us a history of the development of human thought, for it is conditioned by an earlier history concerning which it cannot of itself give us any knowledge.

### Cultural psychology

Given the problems of investigating apperception, Wundt argued that there must therefore be an alternative to experimental psychology — a way to investigate social, cultural and historical phenomena beyond the confines of the laboratory. This would be a kind of social psychology based on the historical analysis of human cultural products, especially language, myth and customs. Experimental psychology rightly studied the lower perceptual processes of sensation and perception. But cultural psychology — or what Wundt called 'völkerpsychologie' — examined the higher processes of thinking, emotion and other products of collective activity.

Two different laws, Wundt explained, governed the two systems: the higher system was governed by the laws of apperception; the lower system by the laws of association. The higher processes presupposed the lower ones but they were not determined by them. A complete psychology must therefore embrace both quantitative and qualitative methods.

### Developments in the USA

While Wundt embarked on what would eventually become ten volumes of *Völkerpsychologie*, his students returned home to launch scientific psychology in America. The first American experimental psychology research laboratory was established by G. Stanley Hall at Johns Hopkins University in 1883. Four years later, James McKeen Cattell founded one at the University of Pennsylvania. They closely followed Wundt's practice of stocking their laboratories with impressive-looking 'brass instruments'. By 1913 there were ten times as many psychological laboratories in the USA as there were across the whole of Europe.

It was an exciting time to be a psychologist. America was hoping that the new discipline could apply its know-how to solving problems

in business, education and the military. Such a practical ethos evidently had no need for a philosophically-informed qualitative theory of culture. It was not the right time to reflect on the charms of the world's many languages, myths and customs. America's melting pot was mixing immigrants from across the globe in order to forge a new society for a new century. Wundt's cultural psychology — half of his overall vision for psychology — was ignored.

### And in the end...

A year after Wundt's death, the cover of the October 1921 issue of *Popular Science Monthly* magazine showed Babe Ruth, the greatest baseball player of the day, ready to swing, his bat awkwardly attached to a Hipp chronoscope (a timing device). 'Babe Ruth's Home Run Secrets Solved By Science', the story proclaimed (Fuchs 1998). His so-called secrets were his rapid speed of reaction and his extraordinary hand-eye coordination. The self-satisfied piece was little more than propaganda for the new 'applied psychology'.

Wundt would have been appalled by this illegitimate extension of laboratory methods. He would have been even more disappointed by the failure of American psychology to study the social and cultural origins of the human mind. Yet at the very moment that



A Hipp chronoscope, as used in Wundt's psychophysics experiments

his blueprint for psychology was being torn up, Wundt was being elevated into position as the chief architect, the man who had started it all. The true legacy of the man they were already calling 'the father of psychology' was being systematically dismantled.

PsychologyReviewExtras



Go online (see back cover) for a podcast giving personal reflections on Wundt's ideas and the emergence of scientific psychology.

### References

- Baldwin, B. T. (1921) 'In memory of Wilhelm Wundt. By his American students', *The Psychological Review*, Vol. 28, No. 3, pp. 153–88.
- Cattell, J. McK. (1890) 'V. — Mental tests and measurements', *Mind*, Vol. 15, pp. 373–81.
- Danziger, K. (1990) *Constructing the Subject: Historical Origins of Psychological Research*, Cambridge University Press.
- Fuchs, A. H. (1998) 'Psychology and "The Babe"', *Journal of the History of the Behavioural Sciences*, Vol. 34, No. 2, pp. 153–65.
- Kusch, M. (1995) 'Recluse, interlocutor, interrogator: natural and social order in turn-of-the-century', *Psychological Research Schools. Isis*, Vol. 86, No. 3, pp. 419–39.
- Wundt, W. (1916) quoted in John D. Greenwood (2003) 'Wundt, Völkerpsychologie, and experimental social psychology', *History of Psychology*, Vol. 6, No. 1, pp. 70–88.

Dr Geoff Bunn is senior lecturer in psychology at Manchester Metropolitan University. He is the author of *The Truth Machine: A Social History of the Lie Detector* (2012) and the co-editor of *Psychology in Britain: Historical Essays and Personal Reflections* (2001).