

history of the world (of psychometrics)

... AS SEEN BY AN ENLIGHTENED TRAVELLER

Psychometrics: *a branch of psychology which creates and studies theories, methods and techniques for evaluating and measuring an individual's psychic capacity, using tests, inventories and other statistically valid techniques.*

It is always difficult to define a method or discipline's origins in a precise manner. Psychometrics is no exception here. However, the subject is not neutral: by introducing the notion of measurement into the study of the human mind, psychometrics allows psychology to be differentiated from philosophy, from whence it came. The question of origins thus allows us to date the split between the two disciplines.

1573–1904: the origins of the discipline

Several authors have debated the question of the origins of psychometrics. Greece, China, Egypt... and so on? The practice of evaluating and ranking of candidates or workers has emerged in various places at different times. Can we call this psychometrics already?

Juan Huarte de San Juan, a Spanish doctor and philosopher (c 1530-1588), marks a true starting point. In 1573, he published his *Examen de Ingenios para las Ciencias*, or exam of the mind in sciences, which made its way progressively across Europe. It is the first ever tract that establishes a link between psychology and physiology. But it was the German philosopher Christian von Wolff (1679-1754) who is recognized as the first to have used the term "psychometrics". In his 1732 work, *Psychologia Empirica*, in the note on paragraph 522, he writes: "in the dual way we have of building the foundations of degree of pleasure and pain, psychometrics comes to our rescue. We must learn therein to measure the amount of perfection and imperfection, as well as the degree of certainty of any judgment, so as to establish a scale of perfection and imperfection, as a degree of certainty of the judgments" (*Translated from the Latin by the author*)

In England, Francis Galton (1822-1911), a cousin of Charles Darwin, became interested in the inherited aspects of intellectual capacity. In 1869, in *Hereditary Genius*, he suggested the idea of measuring genius in an individual by the frequency with which he or she bettered the performance of a given group of individuals. He later conceptualized the calculation of a correlation coefficient which would then be perfected by one of his disciples, Karl Pearson (1857-1936), and this would lead to the formalization by Charles Spearman (1863-1945) of the notion of **factorial analysis**, in 1904. Francis Galton presented his anthropometric laboratory in London in 1884, in which visitors were subjected to measures applicable to broad groups. He then used percentile tables and gave rise to the notion of test **standardization**.

But Germany remains the most fertile ground for the growth of psychometrics as a separate discipline. After Gustav Theodor Fechner (1801-1887), who laid the trail for psychology to be deemed a true science, (*Elemente der Psychophysik*, 1860), his fellow countryman Wilhelm Wundt (1832-1920) can be recognized as the first modern psychologist and the father of experimental psychology. In 1879 he formally created the first psychology laboratory at the University of Leipzig. In 1886, the first thesis in the psychology field was written, under the supervision of Wilhelm Wundt, by an American named James McKeen Cattell (1860-1944). Its subject was a portent of things to come: *Psychometric Investigation*. In 1890, while back in the United States, James McKeen Cattell introduced the concept of mental testing in an article published in the journal *Mind*, and titled "*Mental Tests and Measurements*". He was one of the most influential twentieth century American psychologists. From this point on, psychometrics was to grow increasingly rapidly.

1905–1974: the blooming of a new discipline

In 1905, two Frenchmen, Alfred Binet (1857-1911) and Théodore Simon (1873-1961) made their mark on the universe of psychometrics. At the request of the Minister for Education, who wished to identify the children likely to have most learning difficulties, they came up with the first **metric intelligence scale** and presented their diagnostic tests at the Rome International Psychology Congress. The Binet-Simon test had huge success worldwide and roused the interest of numerous American psychologists, of whom Lewis Terman, (1877-1956), a Stanford University professor, adapted it and renamed it the *Stanford-Binet* in 1916. The measurement of intellectual aptitude developed fast in an America that was very keen to find objective evaluation criteria. The First World War gave Robert Yerkes (1876-1956) the chance of administering verbal and non-verbal intelligence tests (*Army Alpha and Army Beta*) to more than 1 700 000 American soldiers. David Wechsler (1896-1981) then participated in the recruit evaluations for the army using the *Alpha* test. This practice led him to realize that this view of intelligence was not applicable to everyday life. In 1938, he developed a battery of intelligence tests, known as

the *Wechsler-Bellevue Intelligence Scale* (WBIS). He took up the ideas of the German psychologist, William Stern (1871-1938), who, in 1912, introduced, in *Die Psychologischen Methoden der Intelligenz-prufung und deren Anwendung an Schulkindern* (Psychological Methods of Intelligence Measurement), the calculation method that led to the **Intelligence Quotient**, or IQ. David Wechsler revised his test, which rapidly became the most widely used in the US, and then launched successively the *Wechsler Intelligence Scale for Children* (WISC) in 1949, the *Wechsler Adult Intelligence Scale* (WAIS) in 1955, and finally the *Wechsler Preschool and Primary Scale of Intelligence* (WPPSI) in 1967. The initial idea of the Frenchmen, Binet and Simon laid the groundwork for the huge commercial success of the American testing industry.

In parallel to the rise of the measures of intelligence, the field of **personality** evaluation started to develop, albeit a little more slowly. During the First World War, Robert Woodworth (1869-1962) invented the *Woodworth Personal Data Sheet*, which was recognized as the first personality test in the modern sense of the term. Made up of 116 questions, in a yes/no format, the WPDS is set up so as to predict the risks of emotional disorders in soldiers in combat. It had a significant impact, as much with the model and the questionnaire construction as with the scale measured which would later give rise to a neuroticism factor in the “Big Five” model. In 1937, Gordon Allport (1897-1967), in his work *Personality: a Psychological Interpretation*, introduced a theoretical model of **personality traits**. His work was based on a lexical approach and the systematic study in contemporary English dictionaries of almost 18 000 adjectives and nouns that described a personality or a mental state. In 1938 Henry Murray (1893-1988) published *Explorations in Personality*, a reference work in which he very precisely defines an exhaustive list of personality traits, which will be an inspiration later to several authors of inventories (George Stern with the *Activity Index* in 1958, Allen Edwards with the *Edwards Personal Preference Schedule* in 1959, Douglas Jackson with the *Personality Research Form* in 1967, etc.). In the 1940's, Raymond Cattell (1905-1998) worked on lexical research carried out by Allport and d'Odbert, and published in 1949 the first version of his famous inventory, the 16PF. Raymond Cattell, despite various controversies that surrounded him, (*The Cattell Controversy: Race, Science, and Ideology*, by William Tucker, 2009), was equally at the origin of the concept of **fluid intelligence** and **crystallized intelligence**.

During the Second World War, Katharine Briggs and her daughter Isabel Briggs Myers, worked on Carl Jung's **typological model**, so as to facilitate the entry of female workers into the war industry. In 1942, they created the first version of the famous *Myers-Briggs Type Indicator* (MBTI[®]) which would not get its definitive name until 1956. It would be impossible to list here all the great psychologists who contributed to the psychology of personality traits, but it would not be fair not to mention Ernest Tupes.