Resource 1: Definitions of intelligence

Around 100 years ago, psychologists first attempted to define intelligence and to find ways of measuring it. One of the influential early psychologists of intelligence was the Englishman, **Charles Spearman** (1863-1945).

Spearman's researches led to the development of the 'two factor' theory of intelligence. This posits that the performance of any intellectual act requires a combination of two types of intelligence:

• 'g' – general intelligence, a single general capacity for conceptualising and problem-solving which is available in the same individual, to the same degree, for all intellectual acts, and

• 's' – specific factors which are specific to that act and which vary in strength from one act to another.

While predictions of performance on tasks with a high 's' factor are less accurate, nevertheless since 'g' pervades all tasks, the most important information to have about a person's intellectual ability is an estimate or measurement of their 'g'.

David Wechsler (1896-1981) was clinical professor at the Medical College, New York University from 1933 to 1967, having earlier worked with Spearman. His research – derived originally from administering and interpreting mental exams to army recruits to place them in the jobs best suited to their abilities – led to the opinion that Spearman's two factor theory of 'g' and 's' was too simplistic. An adequate definition of intelligence must be broader because intelligence is an aspect of the total personality rather than an isolated entity. So, he defined intelligence in a person as 'the global capacity to act purposefully, to think rationally, and to deal effectively with his environment'. This definition implied that intelligence is not one capacity, but a many-faceted aggregate. So he devised his tests (Wechsler Intelligence Scale for Children – WISC, and Wechsler Adult Intelligence Scales – WAIS) based on ten or eleven verbal and performance sub-tests.

HJ Eysenck (1916-1997) was Professor of the Psychology Department at the University of London Institute of Psychiatry from 1955 to 1984. He took a 'hard science' approach to defining intelligence, seeing it as a theoretical construct similar to the basic ideas of physics. He referred to three types of intelligence:

• intelligence A: the biological foundation of mental ability – the brain's physiology

• intelligence B: how intelligence A shows itself, and everything that influences its expression in real life behaviour

• intelligence C: the level of performance on psychometric tests of cognitive ability

Continued on next page…

It was of course inevitable that the views of Spearman and others would be challenged. Other psychologists argued for the existence of a number of factors within intelligence. One eminent example is **LL Thurstone** (1887-1955).

Thurstone was a psychometrician, for almost thirty years Professor at the University of Chicago. He believed that an understanding and analysis of intelligence must begin with people and their attempts to reach their goals. He made an analysis of intelligence tests and tests of perception, and concluded that intelligence is made up of several primary mental abilities rather than 'g' and 's'. He was among the first to state that there are many ways in which a person can be intelligent, and his *Multiple Factor Analysis* listed seven primary mental abilities:

- verbal comprehension
- word fluency
- number facility
- spatial visualisation
- associative memory
- perceptual speed
- reasoning

This theory has been used to develop intelligence tests that give a profile of the individual's performance over each ability test, rather than a general intelligence test that yields a single IQ score.

Raymond B Cattell (1905-1998) was educated in England, but did most of his research as Professor in Psychology at the University of Illinois. He applied advanced statistical techniques to the study of intelligence, developing the theories of crystallised and fluid intelligences. Unlike Thurstone, he argued that within the several components of intelligence, there was a hierarchical relationship. General, verbal and numerical intelligence took precedence over more specific components.