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INTELLIGENCE: THEORIES AND ISSUES

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ABSTRACT:

Of all the areas of Psychology, intelligence is probably the most controversial. At the same time, it is also one of the oldest areas of the discipline, dating back to the 1880's with the work of Francis Galton on individual differences in sensory functioning research that has been devoted to the topic of intelligence. The aims of this chapter are considerably more modest: a) to give a brief historical overview of the area; b) to show how developments in the field are tied to the methodologies used to study intelligence; c) to describe current approaches to intelligence; and d) to introduce the reader to some of the main controversies in the area. This article will trace the developments of the construct, from Spearman's (1904) early conceptions of intelligence as mental energy to the much broader conceptions of modern day theorists. The article will also deal with the wider social context and the implications of our understanding of intelligence for society in general. As will be seen, it is not an

easy construct to understand but it cannot be ignored because, along with personality, it is one of the most fundamental aspects of the human psyche.

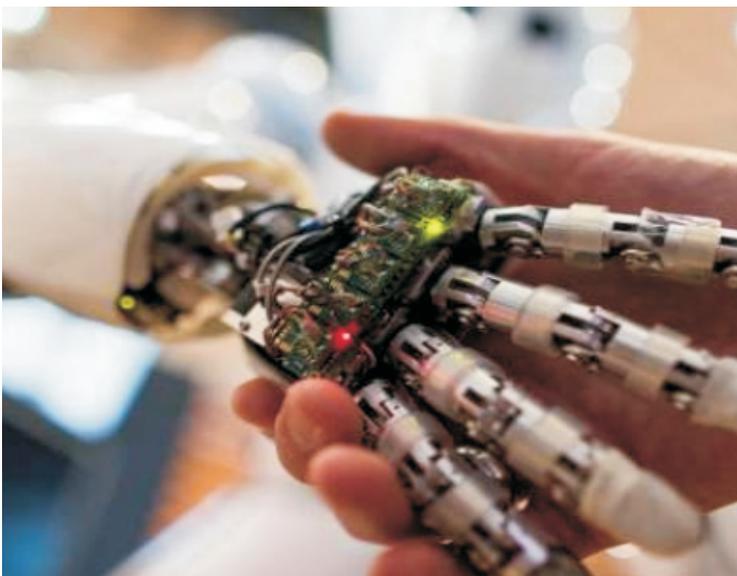
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INTRODUCTION

Why Is Intelligence Such an Important Topic?

What sets the area of mental abilities apart is the perceived importance of these abilities in our daily lives. We accept that we are physically stronger or weaker than other people, but few of us care much that someone is stronger or weaker than we are. It doesn't make a great deal of difference to our lives. In the cognitive domain, however, we are constantly compared with others, we compete with each other at a cognitive level for the best courses at universities, the best jobs, and for the best partners in life. Gottfredson (1997) stated "...no other ability has been shown to have such generality or pervasiveness of effect as does intelligence"

The ancient Greeks were aware of the concept of intelligence, the Chinese before them, and every culture since. Former Australian Prime Minister, Bob Hawke, used the term "clever country" to describe his vision of what kind of a nation he thought Australia should become. Newspapers, particularly the Sunday variety, often contain stories on some new wonder drug or some new training programme that can increase



intelligence. The popular media is also fascinated by displays of intelligence: children who can perform amazing computational feats, quiz show marvels who can recall facts with astonishing speed, musical and artistic prodigies, and so on. However, if we are to heed the advice of our former leader, and aspire to be clever, we must begin with some understanding of what the term means. As we shall see, it tends to mean different things to different people.

DEFINITIONS OF INTELLIGENCE

A satisfactory definition of intelligence has always proved elusive. A symposium of 17 experts in the field convened by the editor of the Journal of Educational Psychology in 1921 to discuss the meaning of intelligence came up with almost as many interpretations as there were experts present. Intelligence was variously described as "ability to learn" (Buckingham), as "the power of good responses from the point of view of truth or fact" (Thorndike), as "the ability to carry on abstract thinking" (Terman), as "the ability of the individual to adapt himself adequately to relatively new situations in life" (Pintner), as "involving two factors - the capacity for knowledge and the knowledge possessed" (Henmon), as "the capacity to acquire capacity"

Carroll (1993), to whom the author is indebted for the above information, reported that a similar symposium was convened in 1986 by Sternberg and Detterman to update the findings of the 1921 symposium. Twenty-five experts at the 1986 symposium came up with almost as many views of intelligence. Intelligence was described as "a quality of adaptive behaviour" (Anastasi), as "the end product of development in the cognitive-psychological domain", as "a societal concept that operates in several domains - academic, technical, social, and practical" (Carroll), as "error-free transmission of information through the cortex" (Eysenck), as "acquired proficiency" (Glaser), as "mental self-government" (Sternberg). Carroll (1993) reported that "the symposium did not produce any definitive definition of intelligence, nor was it expected to"

THEORIES OF INTELLIGENCE

There are too many theories of intelligence to cover in a single chapter but some have been much more influential than others. These will be summarised in the following section.

SPEARMAN'S ONE-FACTOR THEORY

The figure normally associated with the origins of the concept of intelligence is Francis Galton who, in the late 1800's, was using tests of sensory discrimination to measure intellectual ability, often judged at that time by teachers' ratings. The idea of using such simple tests would strike many people today as being naive but Galton was anything but naïve.

Thurstone's theory of primary mental abilities

Spearman was aware of the evidence accumulating against his two-factor theory but he continued to emphasise the importance of the general factor. The real challenge to his theory came in the person of U.S. psychologist, Thurstone, who used his own versions of the new technique of factor analysis to demonstrate that there was not one underlying ability but a number of independent abilities. In order to understand the basis for his challenge, a brief introduction to factor analysis is necessary.

Hierarchical Models of Intelligence

The first well-acknowledged hierarchical model of intelligence was proposed by Phillip E.

Vernon, a colleague of Spearman's. Vernon (1950) described a structure which placed 'g' at the top of an inverted tree-like figure. Immediately below 'g' were two other broad abilities, v:ed (verbal-educational) and k:m (spatial-mechanical-practical). Branching out from each of these were narrower group factors. For example, verbal ability was viewed as a narrow group factor located under the v:ed broad group factor and spatial ability was a narrow group factor under the k:m group. More specific abilities were located at a lower level still. Although, his model allowed various kinds of group factors, some broader than others, Vernon still felt that 'g' was the major determinant of individual differences in performance on cognitive tasks.

Other models of intelligence

There are other models of intelligence that are also based on factor analysis or modifications of factor analysis. One of the most interesting of these is Guttman's radex theory (Guttman, 1954) in which he ordered ability tests in two ways, according to their complexity and according to their content. The first of these orderings is called a simplex, in which a proper ranking is possible. The second is called a circumplex, where proper ranking is not possible but where contents may still be displayed by ordering them in a circular way. It is possible to combine these two orderings in what Guttman called a radex where more complex tests are located towards the centre of a series of concentric circles representing increasing complexity, and where the various content areas are shown as sectors.

Issues and controversies in intelligence

Unfortunately, the field of intelligence is as well known for its controversies as for its contributions to understanding human behaviour. Some of the controversies have attracted widespread publicity. This section will touch on the main controversies and relate their origins to work discussed earlier in this article.

Improvement in Intelligence

The issue of whether intelligence test scores can be improved over the span of an individual's life is a complex one. At a general level, intelligence is like everything else: use it or lose it, as the popular saying goes. Given the right circumstances, obviously some improvement is possible, but it depends on what type of intelligence one is talking about. Crystallised intelligence can certainly go on improving, until late in life it seems. Fluid intelligence, on the other hand, appears to suffer a decline before one has reached middle age. Life habits (e.g., drug abuse) can accelerate the decline.

The role of the general factor

Perhaps the most contentious issue in the history of research on intelligence has been the role of the general factor. Spearman and Thompson debated whether it existed and researchers since then have debated the importance that should be attached to it. Hierarchical models of intelligence showed that there was no necessary incompatibility between theories that stressed the general factor and theories that stressed primary mental abilities; it just depended where you looked in the hierarchy. Nevertheless, the question of the relative importance of each has always generated fierce debate.

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