

Cognitive Psychology and Psychometric theories Of Intelligence

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Abstract

Introduces fundamental issues in cognitive psychology. the belief that that the principles of cognitive psychology should be introduced in such a way that students see their direct pertinence to and potential impact upon human affairs. It is aimed principally at the undergraduate who is taking a basic course in cognitive psychology, in memory and cognition, or in human memory.

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Introduction

Cognitive studies suggest as regards the different theories of intelligence? Evidence is against a completely unitary view of intelligence. The large number of dissociations documented by experimental and neuropsychological studies show a mind that has to be fractionated. Low level processes, like sensory discrimination, rapid naming, etc., can be described as independent modules largely automatic, out of the control of central processes and transfer effects [1]. People who are very good in a particular ability are not necessarily good in other basic abilities. This evidence could be considered in favour of the popular view that there are different forms of intelligence. For example the multiple intelligence theory assumed that there are different and independent forms of intelligence substantially defined on the basis of the domain involved: numbers vs. language vs. logical concepts vs. music vs. space vs. motor representations [2].

Documented that a complete separation of functions is easier for low level processes than for high level processes. The same type of description and differentiation given for basic skills does not apply to high level processes, like reasoning, cognitive control, etc. These abilities are not based only on automatic processes, they can be at least partially transferred and involve a series of interconnected operations [3]. In this respect it is hard to demonstrate that domain specific forms of intelligence all have the same cognitive status and that they also share the same status with more domain free skills concerning reasoning, problem solving, and general knowledge. People can still be very efficient in a large range of situations, even if they are poor in musical or kinesthetic intelligence, but this is not true, at least not to

the same extent, if they are poor in logical or verbal intelligence [4].

The studies of human intelligence, one could simplify the issue by asserting that only high level processes define intelligence, whereas the other ones offer a simple support to intelligent operations but are neither critical to intelligence nor can they be easily differentiated between people [5]. simple conclusion would underestimate the importance of the extraordinary manifestations of intelligence associated with specific forms of intelligence, for example in the areas of music, art, or calculation, etc. Furthermore, there is substantial evidence showing that basic automatised computations, like immediate memory or speedy processing can explain an important portion of the variance in human intelligence as measured by traditional tests. In other words, it seems that neither unitary, nor multiple models of intelligence are in complete accordance with the evidence emerging from studies [6].

hierarchical representation of intelligence, component seems more central since the authors suggested, in their "investment" theory, that the Gf component allows for the development of the Gc. In fact, Gf refers to the mind's ability to make a series of operations (like classifications, seriations, analogical reasoning) without the need to refer to preexisting knowledge. On the contrary, Gc refers to the mind's operations which strongly rely on knowledge, i.e., on cultural background and on stimulus familiarity, which in turn have been developed through the critical contribution of Gf. (Examples of contexts and tasks measuring Gc can be found in the areas of numerical, mechanical, and lexical abilities.) The two-factor theory offers a series of interesting

elements of attraction. In particular it seems able to explain variations in intelligence, because both factors develop with age but very soon the Gf starts a slow decline whereas the Gc remains high until old age, explaining why elderly people may meet difficulties with unfamiliar material, and yet be highly competent in verbal tasks and in the manipulation of well-known material. Psychometric approaches may offer important methods and inputs for the study of human intelligence. However, they are in some way theory-opaque because they define their constructs on the basis of tasks and statistical indexes [7]. This may not be a problem in applied fields but can create difficulties when the constructs must be inserted within a description of psychological functioning. Furthermore, in certain practical contexts, psychometric indexes may not be entirely adequate, for example in the case of an individual who is particularly poor in a specific intellectual component and needs a rehabilitation programme.

The component to be rehabilitated and a specific programme devised if its nature and characteristics and its relationship with other cognitive functions are unknown. In particular hierarchical theories based on psychometric evidence pose a serious problem. It is not clear to which psychological processes the highest stratum or components correspond. Cognitive Psychology has isolated powerful cognitive mechanisms that appear to be critical predictors of high level intelligence and underlie different cognitive tasks. Reference to these mechanisms could help in the specification of the most central components of human intelligence. In this context, some classical cognitive studies have been able to show the relationship between intelligence and efficiency in certain basic computations. In a pioneering study, showed that the efficiency in basic computations, like short-term memory span and the speed in simple comparisons, predicted individuals' IQ [8]. Along the same line of reasoning, Kail and Salthouse, both separately and together, proposed that basic speed of processing could underlie a series of different cognitive tasks: Smarter people are faster; the development of intelligence in children is associated with the development of speed and elderly people lose speed. In this respect, there is evidence that even the speed in very simple tasks, for example in the inspection of simple patterns or lines for giving identity judgements, is highly correlated with intelligence [9]. A meta-analysis on 4000 cases, found a correlation of .50 between IQ and inspection time. They also found that this correlation was not affected by the age of the individuals or by the nature of the to-

be-inspected stimuli. If we consider intelligence according to the traditional view, i.e., the ability to solve problems and/or to perform complex reasoning tasks, the association of intelligence with speed in doing trivial comparisons can seem bizarre and unconvincing [10].

Conclusion

Psychology has contributed significantly to the theoretical understanding of certain mental processes studied in cognitive psychology and cognitive neuroscience. It also shows that neuroscientific research on motor imagery can benefit from increased collaboration with cognitive psychology. Overall, I conclude that the domain offers cognitive researchers a rich and dynamic natural laboratory in which to study how the mind works.

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