

Thinking styles and performance.

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Cognitive style is widely recognized as an important determinant of individual behavior in the psychology literature [1-3] and has been conceptualized as a "high-order heuristic that individuals employ when they approach, frame, and solve problems" [2]. However, there is conflicting evidence in the literature as to the ways in which cognitive styles facilitate or inhibit performance. This review assesses what we know about the predictive role of cognitive style on performance and suggests avenues for future research.

Cognitive style refers to an individual's preferred and habitual approach to organizing, representing, and processing information. Research has shown that: (1) cognitive style is a pervasive dimension that can be assessed using psychometric techniques; (2) it is stable over time; (3) it is bipolar; and (4) it describes different rather than better thinking processes [2-14].

Cognitive style is generally thought of as having multiple dimensions, including decision making, learning, personality, and awareness [15]. One dimension, awareness — of people, ideas, objects and incidents — is considered to be especially important [1,15]. This dimension can be conceptualized as a continuum ranging from intuitive to analytic, and has been frequently used to represent the whole construct of cognitive style [2].

The seminal works of Epstein [5] and Kahneman [14] all used different terminology to distinguish intuitive from rational/analytical thinking styles. Nevertheless, there is a general consensus on the core features. Rational/analytical thought is defined as effortful, sequential, rule-based, and precise, whereas intuition is considered effortless, holistic, associative, rapid, affective, and non-conscious. According to Cognitive Experiential Self-Theory (CEST), the "rational system" is a verbal reasoning system and the "experiential system" (intuitive) is preconscious and nonverbal [5,6]. Epstein argued that behaviors and decisions are guided by both affect-laden experiential and rational-analytic parallel systems [5,8,16-18].

Norris and Epstein [19] suggested that the rational system is a conscious reasoning system that enables people to solve problems through logical principles and the evaluation of evidence. On the other hand, the intuitive (experiential) system is an automatic learning system that implements the three forms of automatic, associative learning; i.e., classical conditioning, operant conditioning, and observational learning. Epstein and Curtis [7] found that the rational thinking style is more logical, analytic, involves slower processing, is highly integrated and requires justification via logic and evidence. The intuitive (experiential) system is more holistic, associative, affective, involves more rapid processing, and is more crudely integrated and self-evidently valid (experiencing is believing). Intuitive individuals are likely to observe cues or signals through unfamiliar and unorganized

information that is processed in a synthetic and holistic manner [20]. Olson described the analytic process, where individuals rely on linear, sequential processing of information. Thus, whereas intuition may be linked to creating new, novel, and innovative ideas which can be described as based on 'thinking outside of the box', the analytic thinking style may be more associated with existing knowledge or thinking 'inside the box'.

Although studies have generally found positive associations between performance and a rational thinking style, results for the intuitive (experiential) style have been either non-significant or associated with poor performance.

The deliberative (rational) approach has often been considered the best path to decision making [13]. However, recent evidence suggests that using affect as a heuristic in decision making may be equally important. The potential benefits of the intuitive system have been highlighted [14,21-25]. In particular individuals who have a high level of skill or expertise within a given domain appear to rely to a greater extent on intuitive judgments [21,22]. Intuitive thinking system may also be superior to the rational-analytical system in some kinds of complex information processing [4,18]. These findings raise the question of whether there are tasks where the intuitive style will predict better performance than the rational/analytical thinking style.

The intuitive thinking style was found to be associated with creative thinking as well as with better complex decision making. The intuitive thinking style may also be superior to the rational thinking style in terms of innovation. Novel ideas (creativity) can become applicable (innovation) and contribute economically to a firm [17]. In addition to promoting firm performance in general, innovative firms have been shown to outperform non-innovative firms in terms of productivity and growth [3,9]. An intuitive thinking style may contribute to tasks (including cognitive ones) that call for creativity and innovation.

Inbar et al. [12] argued that to the extent to which a judgment or decision resembles a task that requires the simultaneous, rapid processing of a very large number of cues, people tend to rely on intuition: participants exhibited a pronounced sensitivity to features of the decision at hand when deciding whether to choose on the basis of intuition or reasoning. When the decision task had features associated with reason, it cued rationality. When the decision task had features associated with intuition, it cued intuitive processes, and people obeyed their gut. These findings are consistent with Cognitive Continuum theory [10] which posits that just as thinking can be described as relatively rational or intuitive, tasks can be described as rationality-inducing or intuitive-inducing on a task continuum. Accuracy is thought to be maximized when the position of the decision

maker on the cognitive continuum matches the position of the task on the task continuum [11].

This review strongly suggests that thinking styles predict both the quality and quantity of performance. This calls for empirical studies that can bridge the gap in the literature on intuitive and analytical thinking styles to better predict performance [26].

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