

Thinking thanks to constraints

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To deal with the inevitable uncertainties of reasoning in the real world, thought must of necessity process probabilities, implicit assumptions, and beliefs. This leads to a more complex view of rationality, less concerned with and less focused on the quantitative limits of conscious thought, imposed by the working memory capacity, and more centered on the ability to contextualize and exploit the complexity of what is real.

We propose a conception of mind bounded by the qualitative constraint of relevance at conscious and unconscious levels. The core of this conception is an *interpretative function*, as adaptive characteristic of the human cognitive system. The search for meaning, in view of an objective, characterizes every activity of the human cognitive system at all levels, from perception to language and to reasoning. Rather than abstracting from contextual elements, this function exploits their potential informativeness. It guarantees cognitive economy when meanings and relations are familiar, permitting fast recognition. This same process becomes much more arduous when meanings and relations are unfamiliar, obliging us to face the novel. When this happens, we have to come to terms with the fact that the usual, default interpretation will not work, and this is a necessary condition for exploring other ways of interpreting the situation. A restless, conscious and unconscious search for other possible relations ensues until everything falls into place and nothing is left unexplained, with an interpretative heuristic-type process.

This has resulted in a reevaluation of implicit-intuitive thought, the “shadow zone” (Macchi & Bagassi, 2012, 2014, 2015), which in the past was considered responsible for automatisms and frequently for errors in reasoning and decision making. Our perspective is supported by experimental evidence from our research on insight problem solving, which we consider a privileged route to understanding what kind of special unconscious thought produces the solution.

A consolidated theoretical tradition maintains that conscious analytical thought can reorganize data if the initial representation does not work, extracting information from the failure to search for a new strategy (Fleck & Weisberg, 2013; Kaplan & Simon, 1990; Perkins, 1981; Weisberg, 2015). According to this approach, analytic thinking, given its dynamic nature, can produce a novel outcome; in problem solving in particular, it can generate a complex interaction between the possible solutions and the situation, such that new information constantly emerges, resulting in novelty. It could be said that, when we change strategy, we select a better route; this change is known as “restructuring without insight,” which still remains on the conscious, explicit plane.

However, this concept of rationality does not explain how we suddenly see the solution to a problem after a period of the impasse, during which our conscious analytical thought has stalled and does not extract any useful information from the failure; thought is incapable of throwing light on how to reach the solution, and if the solution is hit upon, it has the characteristics of a “mysterious event.”

When it occurs, the difficulty does not lie in the onerosity and complexity of the processing to be implemented, in the capacity to consciously evaluate the merits of the various possible outcomes and to settle on a suitable strategy. The issue is the difficulty in changing the representation that does not appear to involve the working memory capacity, nor the conscious retrieval from memory of solutions or crucial parts of solutions to reproduce. It requires of necessity not conscious, implicit processing—incubation—and for this reason it is a challenge to the current theories of thought, regarding the central role of consciousness, given that, in these cases, restructuring (or change in representation) is not performed consciously.

During incubation, we speculate that in the absence of any form of conscious control, *relevance constraint* allows multilayered thinking to discover the solution, as a result of the restless *mind wandering* between the implicit and the explicit levels in search of the relationship of the data that would finally offer an exit from the impasse.

We will discuss our experimental data, speculating that the creative act of restructuring implies a form of high-level unconscious thought, the *unconscious analytic* thought. Implications for reasoning and decision making will be considered.