ABC: A Psychological Theory of Anticipative Behavioral Control

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When the information processing approach arised in the sixties of the last century, cognition was defined as "... referring to all the processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used" Neisser (1967, p.4). Accordingly, cognitive processes has been considered as being stimulus driven. I will argue that this approach is basically misleading as it ignores the determining role of intentions: cognitive processes does not serve to process given stimulation but to support the production of desired or otherwise anticipated stimulation.

The ABC theory (Anticipative Behavioral Control) exemplifies this tenet with respect to the acquisition of behavioral competence. It is assumed that evolution brought about elementary learning mechanisms by which efferent activation patterns (motor commands) became automatically associated to co-occurring reafferences (sensory effects) in such a way that reactivations of certain afferent patterns gain the power to address the efferences they formerly were the effects of (the ideo-motor principle). Furthermore, such ideo-motor associations become conditionalized if the contingency of the motor-sensory connections depend on current circumstances, i.e. on the current state of the acting organism.

The talk will present theoretical considerations as well as experimental evidence in support of the ABC theory, in particular referring to animal and human associative learning and to the impact of behavioral effects on the selection, initiation and execution of simple voluntary acts. Finally, speculations about how the motor output might be controlled by a cascade of increasingly specific sensory anticipations are discussed.