



*ECONA – Centro Interuniversitario di Ricerca
sull'Elaborazione Cognitiva nei Sistemi Naturali e Artificiali*

The Pragmatic Turn in Cognitive Science: an emerging action oriented model of cognition.

Preconditions and possible consequences of a paradigm shift for a naturalistic account of mind and its processes.

INTERNAL CALL

Contemporary cognitive science is quickly shifting toward a new paradigm that focuses on understanding cognition as “enactive”, as a form of practice; this epistemic dynamic can be viewed as a “pragmatic turn” away from the traditional representation-centred cognitive framework.

Criticisms toward the classical computational-representational view of cognition come from robotics (Brooks 1991, Dreyfus 1992, Pfeifer and Bongard 2007); cognitive psychology (Hommel et al 2001, O’Reagan and Noe 2001, Schutz-Bosbach and Prinz 2007); developmental and cognitive neuroscience (Jeannerod 2001, Beauchamp and Martin 2007, Friston 2010, Pulvermuller and Fadiga 2010, Engel 2010), and the new approaches grounded in social cognition.

Recent works from within all these disciplines are grounding knowledge of objects on individual’s experience and knowledge: they are, in Varela’s words, “vehicles of world-making” (1991).

So, an action-oriented paradigm is rising from the enactive approach (developed by Clark 1998, O’Reagan and Noe 2001, Noe 2009, Engel 2010, O’Reagan 2011, Engel et al. 2013) and on the basis of “old” neurobiological/neuropsychological concepts and insights (such as the “reafference principle” – today efference copy – of von Holst and Mittelstaedt (1950) and “dexterity” of Bernstein – in the same period – referring to the agent’s use of “sensorimotor contingencies” to predict consequences of its own actions.

A key premise of this view holds that cognition should not be understood as serving to make models of the world, but rather as subserving action and being grounded in sensorimotor skills. Accordingly, cognitive states and their associated neural activity patterns should be studied primarily with respect to their functional role in action generation. Cognitive processing are closely intertwined with action and with the whole behaviour in individual’s environment.

The concept of action (as used here), anyway, is neither coextensive with that of behaviour nor with that of movement: in a wider sense it includes acts not involving any overt movements (e.g. thinking, calculating, imagining or decision making..). This concept typically makes reference to goals (whereas behaviour can be described without making any reference to mental states).

Such an action-oriented paradigm is already supported by much experimental and neurobiological evidence.

We want to contribute to this paradigm shift by enabling a collective discussion and elaboration of key concepts involved in, since this shift implies a novel approach in a number of fields, including – but not limited to – cognitive science, psychology, neuroscience, philosophy of mind and robotics.

Among the basic premises of this research program there are:

- 1) cognition is understood as capacity of generating structure by action, and system states acquire meaning through their functional role in the context of action
- 2) the functioning of cognitive system is thought to be inseparable from embodiment, and in the same time the cognitive agent is immersed in its task domain
- 3) given the ‘extended’ nature of cognitive systems, a holistic view of the architecture of cognitive systems is required, emphasizing the dynamic nature and context-sensitivity of processing and experience.

From within this epistemological framework, interdisciplinary interactions, different approaches and types of data, are of fundamental value to develop novel and more integrated perspectives.

Hence, this research program is obviously grounded in – and open to - the intersection among many different disciplines:

Philosophy of science, History of science, Epistemology, Politics and Sociology of scientific research (e.g.: Which are the implications of this new conception of mind and behaviour for research programs and experimental strategies in cognitive science? Which could be the methodological, conceptual and philosophical implications)

Developmental, Cognitive Psychology and Cognitive Neuroscience (e.g.: Which novel views on mechanisms of cognitive processes are implied by action-oriented approaches?)

Artificial Intelligence and Robotics (e.g.: What are implications for the modelling of cognitive processes and the implementation of artificial cognitive systems?)

Neurosciences (e.g.: What are the potential implications for a better understanding of cognitive dysfunctions and the pathogenesis of neuropsychiatric disorders?)

Semiotics, Linguistics and Philosophy of Language (e.g.: What are the implications for current models of communication, for inter-subjectivity mediated by verbal and non verbal languages? What are the implications for a better understanding of human-machine communication?).

Proponent subject: Professor Carmela Morabito, ECONA’s representative for the University of Rome Tor Vergata, contact : carmela.morabito@uniroma2.it .