

INTRODUCTION

Elvira Assenza - eassenza@unime.it

The CODISCO prize is now in its second year. It was first awarded as part of the 5th National Conference of Doctoral Studies in Cognitive Science which was held in Noto (Sicily, Italy), from 27th – 30th September, 2011, on the theme: the languages of Cognitive Science: Bioesthetics, Bioethics, and Biopolitics.

CODISCO (Coordinamento dei Dottorati Italiani in Scienze Cognitive – The Coordinating Body for Italian PhDs in Cognitive Science) was appointed to coordinate, modulate and integrate scientific research which has a cognitive approach at various levels from a methodological point of view, building on the concept of the “cognitive challenge” or the fundamental principle that the current complexity of human knowledge can only be addressed through collaboration and by connecting different disciplines (an interdisciplinary approach) and encouraging integration and contact between them (transdisciplinarity).

The multidimensional nature of knowledge, the “network” model that is emerging in today’s scientific and cultural systems, questions both the monadic solipsism in which certain disciplines once took refuge, and the idea of omniscience and synthesis which researchers aspired to until the last century (i.e. as recently as the twentieth century). This “network” implies a two-way exchange at a theoretical, conceptual and experimental level, creating a dynamic balance between the need to be specific in a given field of investigation and the temptation to blend within a single structure the different perspectives of research and its various results through a cross-sector approach.

The task of CODISCO is thus difficult, but over time it has become both challenging and rewarding. The contribution of many young researchers supervised with the utmost care in PhD courses of growing prestige in Italy and abroad, together with the inter- and trans-disciplinary dialogue between young scholars and renowned professors in diverse areas of education, leads to results which find their place not only in current cultural debates, but also in publications of high scientific impact.

Through the cognitive approach, disciplines that were once considered incompatible, such as neuroscience and philosophy, IT and genetics, or ethology and linguistics, meet via cultural exchange and through the thorough interpretation of the experimental and theoretical results achieved. Research protocols are formulated for joint discussion of the data under investigation. The coordination work currently carried out by CODISCO will also undoubtedly have a positive effect on educators and trainers who, as they continue to grapple with the obsolete legacies of the transfer of cultural information, face the methodological difficulties of the multidimensional management of knowledge.

The choices that the Commission necessarily had to make for this second edition of the CODISCO were particularly difficult due to the level of excellence and the methodological robustness of the studies put forward.

The three works that were finally selected, summarized in this volume, stood out for the originality of their research, the methodological precision with which the research was conducted, sensitivity to issues of social impact and, last but not least, the strong line of inter- and trans-disciplinary integration which lies at the heart of cognitive science.

The work of Bianca De Filippis (PhD in Ethology, Ecology, Biosystematics and Anthropology - University of Florence) addresses the issue of Rett syndrome, a rare congenital disease. Rett syndrome is a Pervasive Developmental Disorder which affects girls in childhood, causing severe mental retardation and the emergence of hand stereotypies. In most cases (90%) the disease is caused by mutations in the gene encoding methyl-CpG-binding protein 2 (MeCP2) which is localized in the X chromosome. The progression of the disease is associated with a cognitive deficit that is reflected at a behavioral level. The study makes rigorous use of a mouse model in which a mutation of the MeCP2 gene results in the longer lifespan of the experimental subjects. The innovative ethological approach has shed greater light on the development of behavioral abnormalities, the study of which proved to be of considerable interest in the characterization of pre-symptomatic stage of the syndrome. The results therefore make a valuable and original contribution to the therapeutic, pharmacological and the non-pharmacological approaches used to improve the quality of life of patients affected by Rett syndrome.

Moving next from animal models to those of computational simulation, the work of Vivian De La Cruz (PhD in Cognitive Science - University of Messina) tackles a particularly challenging topic on both the theoretical and practical levels, that of first word learning. The computational models of cortical simulation that are experimentally proposed by De La Cruz use a self-organizing artificial neural network approach to simulate the self-organization of cortical processes related to visual and auditory phenomena. The model used, highlights the emergence of cortical functions similar to those observed in the brain, to show how early word learning may be explained by strictly perceptual learning processes, coupled with cortical processes of self-organization and of fast mapping, without necessarily having to invoke specialized word learning mechanisms, at least not at early stages of language development.

Last but not least in importance and scientific relevance, the work of Francesca Ferri (PhD in Neuroscience - University of Parma) deals with a subject that in the last twenty years has been the focus of debate in many disciplines, both empirical and theoretical: self-awareness and, in particular, the mechanisms of bodily self-awareness. For a long time self-awareness has been interpreted and explained strictly in proprioceptive terms. Through a broadly articulated experimental protocol and by means of her rig-

orous methodology, Francesca Ferri proves the hypothesis that self-awareness is not attributable to a simple, though important, proprioceptive process, but rather to an integrated and multidimensional process, which involves the sensorimotor system. The way in which Ferri shows this experimentally is not, therefore, through a static image of the bodily self, but instead by providing an integrated and dynamic image of its motor possibilities, of the possible projects that the body can achieve in its surrounding environment while perceiving the self and others. The awareness of the bodily self is thus not a “proprioceptive sphere” within which the individual is sealed in an attitude of self-reflection. Instead, a bridge extends to the environment, through which the dynamics of being and acting take place, supported by the requisite neurological correlates (which may now be mapped using neuro-imaging techniques).

In conclusion, the research proposed in this volume shows how current philosophical and epistemological debates are not limited to argument for the sake of argument on the one hand, nor do they tend to uncritical acceptance or institutional isomorphism on the other. There is instead an open exchange of information where the results found in research conducted within one discipline become the starting point for scientific investigation in another. Such exchange promotes a new way of thinking about the ways in which we interact with our own environment, and helps us to reflect on our human responsibilities, be these historical political or social in nature.