

Seminar IRH-ICUB

Consciousness and Cognition: An Interdisciplinary Approach

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Dr. Diana Stanciu

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Date: Monday, 4 July 2016, 10h

**Place: Mircea Florian Amphiteatre, Faculty of Philosophy
Splaiul Independentei 204**

Keynote lecture

Prof. Monica BACIU MD PhD
Université Grenoble Alpes (UGA), Grenoble



A Professor of Cognitive Neuroscience and a specialist in Neurology, Monica Baciu, MD, PhD, has been working at the University Grenoble Alpes (UGA) in Grenoble, France, since 1999. She has been teaching functional neuroanatomy, neuroscience, neuropsychology, neurology and neuroimaging in the Cognitive Psychology Department and she has been doing research in the Neurocognitive Psychology Laboratory and the Neuroimaging Department of the Grenoble Hospital. In 1995 she became a specialist in Neurology at the Iuliu Hațieganu Faculty of Medicine in Cluj. After moving to France, she obtained her PhD in Neuroscience at the Josèphe Fourier University in Grenoble with a thesis on the application of functional neuroimaging (fMRI) in the study of cognitive functions, especially of language, in both normal and pathologic cases (in patients with neurologic and psychiatric impairments). For two years, she worked as an associate researcher in the Neuropsychology Laboratory at the Faculty of Psychology of the Washington University in St Louis, USA, and in the Neurosurgery Department of the Faculty of Medicine (Barnes Jewish Hospital) of the same university – with Prof. Steve Petersen, Prof. Brad Schlaggar and Dr. Jeff Ojemann. During her stay at the Washington University, she was interested in the validation of the neuroimaging protocols through the intra-cerebral electric stimulation and the identification of the functional areas in patients with focal epilepsy that was medication resistant. Now, her research interests focus on the cerebral plasticity of the cognitive functions, especially of language and memory, in patients with epilepsy, tumours and cerebrovascular accidents followed by aphasia. At the same time, she is interested in the evolution of linguistic performance and of the functional cerebral reorganisation of language during both normal and pathologic ageing. The finality of Prof. Baciu's works is twofold: (a) fundamental research and (b) clinical application with the goal of developing new methods and programmes for cognitive rehabilitation that could promote an efficient amelioration of symptoms in patients with cognitive impairment (especially language). She is approaching her research problems from a multidisciplinary perspective (experimental and cognitive psychology, functional neuroimaging, neuropsychology). Alongside her research and teaching activities, Prof. Baciu also has important administrative functions, among which the most notable is the direction of the research laboratory in which she works and the admission of students in Master's, PhD and postdoctoral programmes. She is a senior member of the French University Institute (2010-2015 and 2015-2020).

Multifactorial Representation of Language: Variability and Plasticity

I will present a few studies me and my team have done in order to elucidate the issue of intra- and inter-individual variability of language from a multidisciplinary perspective (experimental and cognitive psychology, neuropsychology, functional neuroimaging). This topic is studied in cases of both healthy subjects and of those with neurologic lesions, in which we evaluate the cerebral reorganisation or plasticity both at an inter-hemispheric level (hemispheric specialisation) and at an intra-hemispheric one (linguistic regional specialization). I will offer examples of such studies on patients with focal epilepsy that is medication resistant. This form of epilepsy represents an excellent neurologic model of cerebral plasticity of language and memory due to the presence of the epileptic area in areas that are functionally essential for language and memory. Moreover, this population of patients allows for the evaluation of several forms of plasticity (chronic – related to the presence of the epileptic area; acute and subacute – related to the curative surgical intervention in some of these patients). The evaluation of different forms of cerebral plasticity is very useful in identifying the multiple *patterns* of functional reorganisation, which depend on a cluster of modulating factors (demographic, clinical and experimental). I will offer examples of evaluation of the modulating effect of these factors in the reorganisation of the functional linguistic networks. The core idea I would like to emphasise in my lecture (on the basis of the examples presented and on the background of other studies done by other research teams in this field) is that language is a complex function that is not at all unitary, has a complex cerebral representation, varies in normal physiological conditions and varies even more in pathological conditions. Then, I would like to emphasise an important aspect of my research: despite the fact that the use of neuroimaging in different patients (I will only give examples of epileptics in this presentation) is obviously a great advantage in understanding the reorganisation mechanisms of the cognitive networks and in the pre-surgery cognitive evaluation of these patients in order to avoid the possible post-surgery impairments, neuroimaging should nevertheless be used in combination with other methods and not as an isolated method. Only in this manner, of a multi-methodological combination and in correlation with the clinical aspects and the demographic characteristics of the patients, the modern methods of neuroimaging can offer the clinicians robust instruments to evaluate the neurocognitive aspects associated to a clinical picture or related to a surgical intervention.