RUB

PHILOSOPHY AND COGNITIVE SCIENCE

Stiftung Mercator

Mercator Research Group

Organization:
Prof. Dr. Markus Werning & Dr. Simone Duca
Website: www.rub.de/phil-lang.
Venue: Thu. 26. May 2011, 16-18h, GA 04/187.
All interested students, scientists, and scholars are cordially invited to the following talk of the research colloquium:

Dr. Giosué Baggio (SISSA, Trieste)

Complex Dynamics of Semantic Memory Access in Reading

Understanding a word in context relies on a cascade of perceptual and conceptual processes, starting with modality-specific input decoding, and leading to the unification of the word's meaning into a sentence model. One critical cognitive event, turning a sensory stimulus into a meaningful linguistic sign, is the access of a semantic representation from memory. Little is known about the changes that activating a word's meaning brings about in cortical dynamics. We recorded the EEG while participants read sentences that could contain a contextually unexpected word, such as 'cold' in 'In July it is very cold outside'. We reconstructed trajectories in phase space from individual EEG time series, and we applied three nonlinear measures of predictability and complexity to either side of the semantic access boundary, estimated as the onset time of the N400 effect evoked by critical words. Relative to controls, unexpected words were associated with larger prediction errors preceding the N400 onset. Accessing the meaning of such words produced a phase transition to lower entropy states, in which cortical processing becomes more predictable and more regular. Our study sheds new light on the dynamics of information flow through interfaces between sensory and memory systems in language processing.

Giousue' Baggio is a Post-Doctoral Fellow at the SISSA International School for Advanced Studies (Trieste, Italy). He obtained his PhD in Cognitive Neuroscience in 2009 from the Donders Institute for Brain, Cognition and Behaviour at Radboud Universiteit (Nijmegen, Netherlands). He was also a visiting fellow of the Max Planck Institute for Psycholinguistics in Nijmegen. Baggio also has a MSc from the Institute for Logic, Language and Computation (Amsterdam) and an MA in Philosophy from the University of Pavia (Italy).