

2015/16 CIMEC PhD Colloquia

LIST

05/11/2015 (CIMEC Welcome Day Talk) **John Duncan** (*Cambridge University MRC Cognition and Brain Sciences Unit*) Title: A core brain system in assembly of cognitive episodes

22/01/2016 (CIMEC PhD Colloquium) **Jody Culham** (*Department of Psychology; Brain and Mind Institute, Western University, London, Canada*) Title: The treachery of images: Why the brain responds differently to real object than photos

26/02/2016 (CIMEC PhD Colloquium) **Rolf Zwaan** Title: The Reproducibility of Psychological Research

01/04/2016 (CIMEC PhD Colloquium) **Lori Markson** (*Department of Psychological & Brain Sciences Washington University in St Louis*) Title: Children's reasoning about social exclusion

14/04/2016 (CIMEC PhD Colloquium) **Kate Watkins** (*Department of Experimental Psychology, University of Oxford*) Title: (Re-)organisation of language and auditory processing in the congenitally blind (anophthalmic) brain

10/06/2016 (CIMEC PhD Colloquium) **Alessandro Farnè** (*Neuro-immersion Lab Director, Integrative Multisensory Perception Action & Cognition team, Lyon Neuroscience Research Center CIMEC Associated Research Fellow*) Title: Tool-use and the plasticity of body representation for action

28/10/2016 (CIMEC PhD Colloquium) **Terrence W. Deacon** (*Professor, Department of Anthropology, University of California, Berkeley*) Title: Neither nature nor nurture: the semiotic basis of language universals

DETAIL

Nov

Speaker: **John Duncan** (*Cambridge University MRC Cognition and Brain Sciences Unit*)

Date and time: Thursday, November 5, 2015 11AM - 12.30PM. Aula Magna, Palazzo Istruzione Corso Bettini 84, Rovereto

Title: **A core brain system in assembly of cognitive episodes**

All human cognition is controlled in a series of attentional episodes, breaking complex problems into simpler, more solvable sub-problems. In human fMRI studies, a common or multiple-demand (MD) pattern of frontal and parietal activity is associated with diverse cognitive demands, and with standard tests of fluid intelligence. Based on behavioral, neuropsychological, fMRI and single unit data, I suggest that the core function of MD cortex is to control complex cognition in a structured sequence of attentional episodes. Using multivoxel pattern analysis of human fMRI data, I show widespread coding of attended information across MD regions. Using single unit data from the behaving monkey, I examine dynamics of task representation as a complex sequence of attentional episodes is constructed and executed.

Jan

Speaker: **Jody Culham** (*Department of Psychology; Brain and Mind Institute, Western University, London, Canada*)

Date and time: Friday, January 22, 3PM – 4.30PM. 1st floor Conference Room, Palazzo Fedrigotti, Corso Bettini 31, Rovereto

Title: **The treachery of images: Why the brain responds differently to real object than photos**

Psychologists and neuroimagers commonly study perceptual and cognitive processes using images because of the convenience and ease of experimental control they provide. However, real objects

differ from pictures in many ways, including the availability and consistency of depth cues and the potential for interaction. Across a series of neuroimaging experiments, we have shown that the brain responds differently to real objects than pictures, both in terms of the level of activation and the pattern. Moreover, in a developmental study, we have found that infants prefer to look at real objects compared to pictures, even after they have habituated to the real object. Taken together, these results suggest that real objects are more engaging, both perceptually and neurally, and open up new research directions to better understand which aspects of real objects drive these effects.

Host: Francesco Pavani

Feb

Speaker: **Rolf Zwaan**

Date and time: Friday, February 26, 2016 3PM – 4.30PM. Corso Bettini, 31, Rovereto, Province of Trento, Italy 1st floor conference room

Title: **A core brain system in assembly of cognitive episodes**

I will review the reproducibility debate in psychology. Some say low reproducibility is business as usual in science. Others say there is a crisis. I agree with the latter view. I will argue why I believe there is a crisis. I will then discuss several ideas that have been proposed to address the crisis. I will conclude with some practical tips about how we, as individual researchers, can enhance the reproducibility of our own research.

Apr

Speaker: **Lori Markson** (*Department of Psychological & Brain Sciences Washington University in St Louis*)

Date and time: Friday, April 1, 2016 3PM – 4.30 PM. Corso Bettini, 31, Rovereto, Province of Trento, Italy 1st floor conference room

Title: **Children's reasoning about social exclusion**

The basic human need to belong has an evolutionary basis and is largely universal. Our intensely social nature provides us with the motivation to seek acceptance, but also makes us vulnerable to rejection. The awareness of and ability to evaluate social interactions appears to emerge in infancy. Infants discriminate between positive and negative interactions and even recognize dominance hierarchies in their observations of third-party interactions. However, there has been little research on the emergence of the motivation to seek acceptance and avoid rejection. Recent research in my lab has been exploring the developmental trajectory of children's early reasoning about the social dynamics of inclusion and exclusion. We present 2- to 4-year-old children with an instance of a group dynamic in which all individuals are included or a single individual is excluded. Our findings suggest that by three years of age, children begin to differentiate between excluders and victims of social exclusion based on the intentions and interactions of participating individuals. The results will be discussed in the context of a broader theoretical framework for thinking about the emergence and development of the human sensitivity to social exclusion.

Speaker: **Kate Watkins** (*Department of Experimental Psychology, University of Oxford*)

Date and time: Thursday, April 14, 2016 3PM – 4.30 PM Corso Bettini, 31, Rovereto, Province of Trento, Italy 1st floor conference room

Title: **(Re-)organisation of language and auditory processing in the congenitally blind (anophthalmic) brain**

Many studies have revealed cross-modal reorganisation of function in the visually-deprived brain with the intact sensory domains evoking activity in the occipital cortex which would normally support vision. The extent and pattern of activation in the occipital cortex varies among these studies and probably reflects population differences in the severity of visual impairment and the age at which vision was lost. Our work has focussed on a small group of blind individuals with bilateral congenital anophthalmia, a condition in which the eye fails to develop. The visual pathway in such individuals has never been stimulated by light or endogenous activity, one or other of which might be sufficient

to initiate functional specialisation. The anophthalmic brain offers a unique opportunity, therefore, to uncover the extent to which the brain's processing hierarchies and modularisation depends on input from the visual modality. I will present imaging data from these participants that explores the organisation of basic auditory processing and language in the anophthalmic brain.

Host: Uri Hasson

June

Speaker: **Alessandro Farnè** (*Neuro-immersion Lab Director, Integrative Multisensory Perception Action & Cognition team, Lyon Neuroscience Research Center CIMeC Associated Research Fellow*)

Date and time: Friday, June 10, 2016 3PM – 4PM. Corso Bettini, 31, Rovereto, Province of Trento, Italy 1st floor conference room

Title: **Tool-use and the plasticity of body representation for action**

Scientists have questioned the origin of the exquisite human mastery of tools. How do we manage transferring the control of our body to that of a mechanical effector in the skilful way humans typically do? Prominent theories proposed that efficient tool use relies on the incorporation of the tool into body representations. However, most studies have focused the plastic changes that tool-use induces on spatial, rather than bodily representations. For example, the Peripersonal Space has been reported to 'extend' to include hand-held tools. We have turned considering the plastic modifications that tool-use must exert on the sensorimotor system to be harmoniously controlled. I will present complementary evidence gathered from behavioural studies to support the hypothesis that high-order representations of body morphology can be updated to incorporate tools as extensions of our body.

Oct

Speaker: **Terrence W. Deacon** (*Professor, Department of Anthropology, University of California, Berkeley*)

Date and time: Friday, October 28, 2016 12PM – 1PM. Corso Bettini, 84, Rovereto, Province of Trento, Italy Palazzo Istruzione, Sala Convegni

Title: **Neither nature nor nurture: the semiotic basis of language universals**

The concept of a "universal grammar" has been hotly contested over the past half century. What is the source of the many highly convergent language structures in the world's many diverse languages? The usual lines of debate divide along nature/nurture lines: e.g. commonalities due to innate evolved cognitive predispositions or due to common discourse demands that become cultural conventions. But nature and nurture do not exhaust the possibilities. Many language universals are analogues to mathematical universals. These universal grammatical constraints are effectively "discovered" in the history of linguistic evolution, language change, and during process of language acquisition due to pragmatic feedback about failed or ambiguous reference. And many of the most critical semiotic constraints are discovered in prelinguistic and extralinguistic iconic and indexical communication. This makes both innate grammatical knowledge and the so-called poverty of the stimulus problem irrelevant.