EUROPEAN SCIENCE FOUNDATION
SETTING SCIENCE AGENDAS FOR EUROPE

Exploratory Workshops Scheme

Standing Committees for
- Humanities (SCH)
- Social Sciences (SCSS)

ESF Exploratory Workshop on

Mirror Neurons and Social Cognition

Turin (Italy), 23-26 September 2008

Convened by:

Riccardo Viale [1], Giacomo Rizzolatti [2] and Corrado Sinigaglia [3]

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SCIENTIFIC REPORT

Executive Summary

The main purpose of the workshop being to discuss the impact of mirror neuron discovery on social cognition, the introduction has been given by professor Giacomo Rizzolatti. As a consequence of his recent discoveries about mirror mechanism, professor Rizzolatti focused his introduction on the role of mirror neuron in intention understanding.

A specific attention was also devoted on the case in which this mirror-based understanding seems to break down as in the autistic spectrum disorder.

The main important topic that were discussed in depth can be resumed in the following points:

- The role of the mirror mechanism in action understanding from both en evolutionary and a developmental perspective. In particular, how to construe the relationship between action mirroring and action understanding as well as the relationship emotion mirroring and emotion understanding: are mirror neurons understanding or emulator neurons?

- What kind of relation is there between the mirror mechanism and the various *top down* mechanisms that are proposed to be at the basis of the higher metarepresentational abilities involved in mind-reading?

- As far as the social cognition dimension is concerned, from a philosophical and psychological point of view, shall we really need to emphasize the embodied dimension of the knowledge or not?

- Basic mechanisms, such as the mirror one, besides revealing the key aspects of the social cognition, enable us to grow up to a higher level such as that of language: what does mirror mechanism tell us about the evolution language? What is the relationship between action and speech mirroring?

Scientific Content of the event

ESF Workshop, that took place at the Fondazione Rosselli in Turin on 24th and 25th September, was very productive. There were many experts coming from different perspectives. It was the first time that researcher of such a level had the opportunity to work together on the basic mechanism of social cognition. Various perspectives and methodologies have been used as a starting point.

The main result has been the substantial convergence on some key points concerning the basic mechanisms of social cognition. In particular, most of invited speakers agreed on the relevance of mirror-based action and emotion understanding in the

phylogeny and ontogeny of mind-reading abilities as well as on the need to develop a multidisciplinary approach to the different levels of social cognition.

All the speakers invited felt the necessity of setting up a deep collaboration between the different research centres that allows researchers to build up a fruitful interaction among various perspectives. The first need is to integrate, as much as possible, the different laboratory techniques related to the study of neural mechanisms and psychological processes underpinnings to social cognition. Besides, there is the necessity to combine the empirical stance with a more and more refined theoretical approach that should allow for explaining the different aspects of social cognition within a unitary framework.

The experiments approached regard non-human primates, adults human being and infants, with a deep attention to the development of the first forms of social interaction. The idea is to understand to what extent a mechanism such as the mirror, can help the evolution and development of the social cognition and when that mechanism must be enriched by higher level forms of knowledge.

As far as we know, it is very likely that action and emotion mirror systems are, at least partly, innate, being linked to our own more basic motor and viscero-motor abilities. Recently, a mirror mechanism was found in birds. This suggests that such a sensori-motor mechanism does not concern only primates, but it is shared by different phyla. Data suggest that mirror system is more fine-tuned in humans than in other primates, as in macaque monkeys, however, further studies are necessary to investigate reason of such difference.

Assessment of the results, contribution to the future direction of the field, outcome

The very interesting aspect of the Workshop is the awareness of the necessity of a multidisciplinary approach that includes the participation of neuroscientists of different backgrounds, psychologists, ethologists, and philosophers.

There is the intention to create such a network by submitting a project to the ESF. Starting from that point of view, we believe that a first step could be the realization of a Volume including all the different contributions and for whose publication the Oxford University Press already expressed its interest.

FINAL PROGRAMME

Tuesday 23 September 2008

afternoon	**Arrival of participants**

Wednesday 24 September 2008

09.00-09.15	**Presentation of Participants**
	Presentation of the European Science Foundation (ESF) **Alain Peyraube** (Standing Committee for the Humanities)
09.15-09.45	**Mirror Neurons: the Authorized Version** **Giacomo Rizzolatti** (University of Parma)
09.45-10.15	**Human Empathy from the Lens of Social Neuroscience** **Tania Singer** (University of Zürich)
10.15-10.45	**Shared circuits for actions, emotions and sensations** **Christian Keysers** (University of Groeningen)
10.45-11.05	*Coffee Break*
11.05-11.35	**Need and Challenges of Two-Person Neuroscience** **Riitta Hari** (Helsinki University of Technology)
11.35-12.35	**Plenary Discussion**
12.35-15.00	*Lunch*
15.00-15.30	**Understanding Action: How Low Can We Go?** **Daniel D. Hutto** (University of Hertfordshire)
15.30-16.00	**The Tuning-Fork Model of Human Social Cognition** **Pierre Jacob** (Institut Jean Nicod)
16.00-16.30	**Mirroring, Embodiment and Social Cognition** **Alvin Goldman** (Rutgers, The State University of New Jersey)
16.30-16.50	*Coffee Break*
16.50-17.20	**Reward Systems and Cognitive Behaviour in Genetically Modified Mice** **Jean-Pierre Changeux** (Institut Pasteur)
17.20-18.20	**Plenary Discussion**
20.00	*Dinner*

Thursday 25 September 2008

09.30-10.00	**Goal and intention attribution in chimpanzees.** **Josep Call** (Max Planck Institute for Evolutionary Anthropology)
10.00-10.30	**Body Representation and Social Equivalences** **Patrick Haggard** (University College London)
10.30-11.00	**How do Mirror Neurons Contribute to Action Understanding** **Gergely Csibra** (University of London)
11.00-11.20	*Coffee Break*
11.20-11.50	**Motor Cognition and Enactive Understanding** **Corrado Sinigaglia** (University of Milan)
11.50-12.50	**Plenary Discussion**
12.50-15.00	*Lunch*
15.00-15.30	**The Meaning of Movements: Crosstalk between Semantics and Kinematics** **Wofgang Prinz** (Max Planck Institute for Human Cognitive and Brain Sciences)
15.30-16.00	**Language, Perception and Action. How Words are Grounded in the Brain** **Marc Jeannerod** (Institut des Sciences Cognitives)
16.00-16.30	**The Grammar of Moral Intuitions: the Irrelevance of Emotion, and the Significance of our Causal-Intentional Psychology** **Marc Hauser** (Harvard University)
16.30-16.50	*Coffee Break*
16.50-17.20	**Social metacognition, empathy and mirroring** **Riccardo Viale** (Fondazione Rosselli)
17.20-18.20	**Plenary Discussion**
18.20-19.20	**Closing Session: Conclusions and recommendations – planning – future cooperation**
19.30	*Workshop Dinner*

Statistical information on Participants

Gender repartition

4 female (18,2 %)
18 male (81,8 %)

Countries of origin

Europe

Germany (2); France (5); UK (3); Finland (1); **Italy** (6 -including convenors); Switzerland (1); The Netherlands (1);
USA (3)

Final List of Participants

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