

# ESF Workshop "Social Communication and the Face"

Convener Andy Calder

Co-conveners Andrew Lawrence & Nathan Emery

## **Scientific report**

### **Executive summary**

The meeting brought together a number of scientists currently working in the field of face research, or more specifically, the face's role in social communication. These included some of the top names in the field, but also a number of younger researchers that have made significant contributions in recent years.

A basic aim of the workshop was to encourage interdisciplinary projects, but in particular cross-species research and increased use of computer technology in social face research. There is clear scientific value to be gained from collaborations that integrate these separate lines of work, and therefore workshops of this sort play an important role in facilitating collaborations. With respect to cross-species research, all three organisers have promoted this approach in published work. For example, Lawrence and Calder (Lawrence & Calder, 2003) have recently argued that emotion research (including facial expression research) should pay particular attention to cross-species homologies. Similarly, Emery (Emery, 2000) has drawn on work in different species in his appraisal of the functional role of eye gaze. These articles demonstrate the need for increased cross-species research programmes, and an aim of the meeting was to identify research questions that would benefit from the use of similar experimental paradigms in both human and non-human research.

With respect to computer technology, the organisers felt that recent advances in this field have the potential of adding an exciting 'virtual' dimension to social face research, and a second aim of the workshop was to identify research questions in both human and non-human research that computer technology could assist. Research by some of the participants had already shown the advantages of using computer morphing technology in facial expression research (Calder, Young, Perrett, Etcoff, & Rowland, 1996; Calder, Young, Rowland, & Perrett, 1997; de Gelder & Vroomen, 2000; Leopold, O'Toole, Vetter, & Blanz, 2001; Morris et al., 1996). However, in recent years, considerable advances have been made in the development of computer-simulated heads, and the workshop provided an ideal opportunity to inform researchers of new opportunities. Indeed, one of the invitees, Dr Karl Grammer, had already begun to explore how psychological research can benefit the development of simulated facial expressions, and provided an

impressive demonstration of these stimuli. By contrast, the workshop enabled researchers to consider ways in which the computer technology might benefit psychological research.

The meeting also offered an opportunity for scientists to communicate the advantages of other technological advances. These included the benefits of the genome project for identifying the genetic correlates of social face perception, as communicated by Professor David Skuse, and the use of depth implant electrodes in patients undergoing surgery for epilepsy to identify neural regions involved in coding specific emotions, discussed by Dr Pierre Krolak-Salmon. Most importantly, however, the meeting provided an opportunity for research scientists in related fields to discuss their research.

The organisers' impression was that all of the aforementioned aims were achieved. Feedback from the participants was extremely positive. The younger scientists in particular were extremely pleased to be invited to the meeting. The ESF places a particular emphasise on including younger researchers, and an opportunity to present work in front of some of the top names in the field is rare and valuable experience. In fact, all participants commented that the meeting was a valuable learning experience, and although I cannot speak for others, I myself have forged links with researchers that have already resulted in collaborative projects.

Overall, the organisers were extremely pleased with the workshop. Dr van Donzel (ESF representative) also mentioned that she felt the workshop was well run and successful.

We are extremely grateful to the ESF for providing funding for the event, and would like to take this opportunity to thank the Standing Committee for Social Sciences, Dr van Donzel, and in particular Valerie Allspach-Kiechel (Administrator, ESF Exploratory Workshops) for their personal and financial assistance.

### **Scientific content of event**

Following an introduction on the ESF by Dr Monique van Donzel (ESF representative), a presentation was given by myself (Dr Andy Calder) outlining the structure of the sessions and the format of the discussion sections.

The programme was divided into five sections across two days. These addressed (i) The development of face processing and social communication, (ii) Comparative aspects - addressed by computer technology (Animats), (iii) Comparative aspects - addressed by non-human research (Animals), and two sections

addressing the neural basis of social communication (iv and v). As I have already discussed, speakers included some of the top names in the field, the quality of talks was extremely good.

A good deal of time was set aside for discussion. In addition to questions addressed to each speaker at the end of their talk, the chairperson for each session (senior members of the invitees, or in one case a prominent researcher from London, Professor Nick Humphrey), led a 30 minute discussion in which they identified key questions arising from the session's presentations. In some cases these questions were addressed to specific speakers, in others to the general audience. The audience included a number of members of the London and Cambridge community that were also prominent researchers in the field or related fields, and this produced a lively discussion. Discussion also continued after each day's events into the evenings.

The role of discussant is a difficult task, but all chairpersons were experienced and provided with guidelines devised by the organisers. These included relating the discussion to issues raised in other sessions of the workshop, in addition to the specific session itself.

At the end of the meeting Dr Andrew Lawrence (Co-convenor) summed up the achievements of the workshop, drawing attention to the contributions made by different researchers and how they met the workshop's aims.

### **Assessment of the results**

The contribution to the field is extremely difficult to assess. However, if our aim was achieved, then it is hoped that the workshop identified points of convergence among different scientific approaches to face research. As discussed in the original application, the workshop had a number of goals. These included increased collaboration of European scientists, identifying points of convergence among different scientific approaches to gain maximal scientific value, and increased communication of potential pitfalls (data that are rarely published) as well as successes.

With these factors in mind, I think all attendees would agree that the meeting provided a rare opportunity to bring together researchers working in all aspects of social face research, an increasingly diverse area. In the original proposal, the organisers outlined the need for increased collaboration among European scientists. Thus, the meeting offered a catalyst to initiate cross-communication. We very much hope that a number of researchers will initiate joint projects as a result of the workshop. We know that we (the organisers) hope to ourselves, and are also considering the potential benefits of applying for an ESF grant to facilitate further communication between members of the workshop.

## References

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Emery, N. J. (2000). The eyes have it: the neuroethology, function and evolution of social gaze. Neuroscience and Biobehavioral Reviews, 24(6), 581-604.

Lawrence, A. D., & Calder, A. J. (2003). Homologizing human emotions. In D. Evans & P. Cruse (Eds.), Emotion, Evolution, and Rationality. Oxford: Oxford University Press.

Leopold, D. A., O'Toole, A. J., Vetter, T., & Blanz, V. (2001). Prototype-referenced shape encoding revealed by high-level after effects. Nature Neuroscience, 4(1), 89-94.

Morris, J. S., Frith, C. D., Perrett, D. I., Rowland, D., Young, A. W., Calder, A. J., & Dolan, R. J. (1996). A differential neural response in the human amygdala to fearful and happy facial expressions. Nature, 383(6603), 812-815.

## Final Programme

See below

## Final list of participants (including all contact information)

See below

## Statistical information on individuals

Countries of origin	Age bracket			Sex	
	30-40	40-50	50-60	Male	Female
Austria	4	7	5	11	5
France					
Netherlands					
Spain					
Germany					
Switzerland					
UK					
USA					
Japan					

European Science Foundation  
Standing Committee for the Social Sciences (SCSS)

**ESF SCSS EXPLORATORY WORKSHOP**

**Social Communication and the Face**

**PROGRAMME**



**MRC Cognition and Brain Sciences Unit  
Cambridge, United Kingdom, 20-23 September 2004**

**Convened by:**

**Andy Calder<sup>①</sup>**

**Nathan J. Emery<sup>②</sup> and Andrew Lawrence<sup>①</sup>**

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<sup>①</sup> Cognition and Brain Sciences Unit, Medical Research Council (MRC)

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The European Science Foundation (ESF) acts as a catalyst for the development of science by bringing together leading scientists and funding agencies to debate, plan and implement pan-European scientific and science policy initiatives.



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It maintains close relations with other scientific institutions within and outside Europe. By its activities, the ESF adds value by cooperation and coordination across national frontiers and endeavours, offers expert scientific advice on strategic issues, and provides the European forum for science.

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ESF SCSS Exploratory Workshop:

**Social Communication and the Face**

Cambridge, United Kingdom, 20-23 September 2004

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**Main Objectives of the Workshop:**

Facial signals constitute the principal form of non-verbal communication, and consequently social face research spans an impressive number of different disciplines and methodological approaches. The workshop will highlight this diversity and attempt to identify potential points of convergence for new research opportunities between researchers deploying a variety of theoretical perspectives and methodologies. These include, cognitive studies (e.g., attention, developmental perspectives, and social cognition), human neuropsychology, brain imaging, and biological correlates (e.g., neuropsychology, neuropsychiatry, functional imaging, ERP/MEG, and functional genomics), non-human primate research (e.g., cell recording, observational methods, and animal signalling theory), and computer-based research (e.g., automated recognition, simulated facial signals, and interactive robots).

These different areas have each made a significant impact. However, there are opportunities for increased scientific value from collaborations that integrate these separate approaches. For example, is it possible to identify research questions that would benefit from the application of similar experimental paradigms to both human and non-human research? Similarly, recent advances in computer technology have added an exciting 'virtual' dimension to social face research, and a second aim of the workshop is to identify areas of research that might be facilitated by the application of this technology.



## PROGRAMME

### Monday 20<sup>th</sup> September 2004

Afternoon *Arrival*  
19.30 *Reception - Prezzo, 21 Northampton Street, Cambridge (see map)*

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### Tuesday 21<sup>st</sup> September 2004

9.00 Registration  
9.40 **Welcome**  
9.45 **Monique Van Donzel** (Standing Committee for the Social Sciences)  
Presentation of the European Science Foundation (ESF)

#### THE DEVELOPMENT OF FACE PROCESSING AND SOCIAL COMMUNICATION

**Chair Simon Baron-Cohen** (Autism Research Centre, University of Cambridge, UK)

10.00 **Mark Johnson** (Centre for Brain & Cognitive Development, Birkbeck College, London, UK)  
*Developing a Brain Specialised for Face Processing*

10.30 **Chris Ashwin, Ofer Golan, Simon Baron-Cohen**  
(Autism Research Centre, University of Cambridge, UK)  
*Face processing in autism: neuroimaging and intervention*

11.00 - 11.30 COFFEE BREAK

11.30 **David Skuse** (Institute of Child Health, University College, London, UK)  
*Genetic and developmental influences on the recognition of facial affect*

12.00 **Simon Baron-Cohen** Discussion  
12.30 - 1.30 LUNCH

#### COMPARATIVE PERSPECTIVES: ANIMATS AND ANIMALS

##### I ANIMATS

**Chair Ruth Campbell** (Human Communication Science, UCL, London, UK)

1.30 **Thomas Vetter** (Dept. Informatik, University of Basel, Switzerland)  
*Morphable face models: a computational framework for face perception?*

2.00 **Karl Grammer** (Ludwig-Boltzmann-Institute for Urban Ethology, Vienna, Austria)  
*Explorations in facial expression simulation*

2.30 **Lola Cañamero** (Computer Science, University of Hertfordshire, UK)  
*Robots as tools and models for emotion research*

3.00 **Ruth Campbell** Discussion  
3.30 - 4.00 COFFEE BREAK





## II ANIMALS

**Chair Nicholas Humphrey** (Centre for Philosophy of Natural and Social Sciences, LSE, UK)

- 4.00           **Nathan Emery** (Sub Dept. Animal Behaviour, University of Cambridge, UK)  
*Comparative psychology of face perception*
- 4.30           **Josep Call** (Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany)  
*Cognitive mechanisms underlying gaze following in apes*
- 5.00           **Tjeerd Jellema** (Dept. Psychology, University of Hull, UK)  
*The neural basis of the perception and understanding of social cues*
- 5.30           **Nicholas Humphrey** Discussion
- 6.00           Close of day
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**Wednesday 22<sup>nd</sup> September 2004**

## THE NEURAL BASIS OF FACIAL COMMUNICATION PART I

**Chair David Skuse** (Institute of Child Health, University College, London, UK)

- 9.30           **Ray Dolan** (Wellcome Dept. Imaging Neuroscience, London, UK)  
*From identity to emotional processing – an hierarchy in face processing*
- 10.00          **Ralph Adolphs** (University of Iowa and California Institute of Technology, USA)  
*Face processing by the human amygdala*
- 10.30          **Ruth Campbell** (Human Communication Science, University College, London, UK)  
*Seeing speech – cognitive and neural considerations*
- 11.00 – 11.30   COFFEE BREAK
- 11.30          **Beatrice de Gelder** (Faculty of Social Sciences, University of Tilburg, Netherlands)  
*Two emotions in one brain: interactions between consciously and unconsciously processed facial expressions*
- 12.00          **Patrik Vuilleumier** (Clinical Neurosciences, University of Geneva, Switzerland)  
*How emotions govern attention*
- 12.30          **David Skuse** Discussion
- 1.00 – 2.00     LUNCH



## THE NEURAL BASIS OF FACIAL COMMUNICATION PART II

**Chair Ray Dolan** (Wellcome Dept. Imaging Neuroscience, London, UK)

- 2.00            **Nathalie George** (Laboratoire de Neurosciences Cognitives, Paris, France)  
*Gaze contact modulates brain responses to faces: evidence from EEG-MEG studies*
- 2.30            **Sakiko Yoshikawa** (Cognitive Psychology, University of Kyoto, Japan)  
**Neural and psychological mechanisms for processing dynamic facial expressions of emotion**
- 3.00 – 3.30    COFFEE BREAK
- 3.30            **Andrew Lawrence** (MRC Cognition & Brain Sciences, Cambridge, UK)  
*Simulationist models of emotion recognition from the face: insights from psychopharmacology and fMRI*
- 4.00            **Andy Calder** (MRC Cognition & Brain Sciences, Cambridge, UK)  
*The neural basis of recognising human signals of disgust and anger*
- 4.30            **Pierre Krolak-Salmon** (Hôpital Neurologique, Lyon, France)  
*Dynamics of facial emotional expression processing in humans*
- 5.00            **Ray Dolan** Discussion
- 5.30            Concluding discussion
- 6.00            Close of meeting

### End of Workshop

19.30            Workshop dinner - Small Hall, Clare College

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**Thursday 23<sup>rd</sup> September 2004**

Departure



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European Science Foundation

## **Objectives of the ESF Standing Committee for Social Sciences (SCSS)**

The mission of the **ESF Standing Committee for Social Sciences (SCSS)** is as follows:

- to promote high quality social science research at the European level;
- to bring 'added value' to nationally funded research through European collaboration between ESF Member Organisations;
- to help support innovative research ideas and approaches emanating from the scientific community, and
- to play an institutional role in strengthening European social science research infrastructure.

**SCSS** supports a limited number of [Exploratory Workshops](#) each year. These workshops allow leading European scientists to explore novel ideas at the European level with the challenging aim of “spearheading” new and preferably inter-disciplinary areas of research.

One desirable outcome of an ESF Exploratory Workshop may be that participants submit **high quality proposals for further ESF activities** (such as "[à la carte Programmes](#)" or a EUROCORES initiative), or **research funding applications** for submission to the EU 6th Framework Programme or to other European or international funding organisations.

In the case of **ESF Programmes** (“[à la carte](#)” or [EUROCORES](#)), which are financed by, and coordinated through, the European Science Foundation, a draft proposal should be submitted to the SCSS Secretariat for advice, to then subsequently undergo further external refereeing. If successful in obtaining SCSS’s scientific recommendation, the proposal will be submitted to ESF Member Organisations for funding on a voluntary basis. More details are available at <http://www.esf.org/scss>.

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