

Affect & Emotion

Newsletter of the NCCR Affective Sciences

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RESEARCH FOCUS



Trust and emotions: The impact of emotional cues on prosocial behaviour

Interview with Professor Ernst Fehr

When it comes to matters of finance, many of us like to think our emotions take a backseat in decision-making. However a project led by Professor Ernst Fehr is providing some fascinating insights into how emotions and emotional cues drive our decision-making processes, both at the level of behaviour and brain activity.

As with all NCCR Affective Sciences programmes, the project is highly multidisciplinary, bringing together methods from economics, psychology, neuroscience and sociology. "This is research at the boundaries of several disciplines," explains Professor Fehr. "From economics we take methods using economic games, from psychology we take tools for influencing emotion and emotional context, and from neuroscience we take insights about neural networks and methods to measure brain activity."

The overarching project consists of several sub-projects, which are at various stages of development. Two of these have results near to publication and the data are showing some interesting findings. Both studies use the so-called 'trust game' which is a stylised representation of social interaction whereby participants choose whether to send money to an anonymous stranger. Once the money is sent, the amount is tripled and the recipient can then decide to send money back to the original donor. The behaviour of the first mover is based on trust that the stranger (or second mover) will return the favour and send some money back, whilst the behaviour of the second mover is based on altruism as there is no financial motivation to return the favour. In the first sub-project participants are shown photographs of the potential recipients of the money, whose faces have been subtly morphed to resemble more or less trustworthy people. "Basically more trustworthy faces are warmer faces," explains Professor Fehr. "Faces that show more positive emotions with the mouths slightly upturned and the eyebrows raised." The results show not only that people will initially give more money to those with 'trustworthy' faces, but also that the recipients of money are more likely to return the favour to those with 'trustworthy' faces. "We are the first to show that emotional cues reflected in facial expressions can change trust-based behaviour," says Professor Fehr. "Previous research has only shown the impact of facial cues on people's assessment of faces, but it's one thing to say we trust someone and another to act upon that trust and give money to that person."

The second sub-project also uses the trust game, but this

time to assess the impact of changes in the emotional context in which decisions are made. The emotional context is manipulated by the threat of unpredictable electrical shocks that elicit negative emotions, such as anger and tenseness. In such contexts, participants either play the trust game with people as in the previous study, or they play a similar game of money allocation but with a computer that returns money according to an unknown algorithm. The objective for using these two games is to examine the influence of emotion on two different types of choices, namely social and non-social decision-making. When playing the game with people, decisions are based on social considerations such as trust, while decisions are influenced by risk assessments or willingness to gamble when playing with a computer.

"According to standard economic theory," says Professor Fehr. "The emotions that we trigger through the threat of shocks should have no bearing on the decisions we make. However what we observe is that being in a painful affective context reduces both our levels of trust and risk taking." Using magnetic resonance scans of the participants' brains, the study explores the neural networks associated with decision-making. These show some general effects of affective context on brain activity in the prefrontal cortex, but they also show more specific effects, depending on whether the decision was based on trust or risk. This indicates that different types of decision-making may rely on different neural pathways. Of particular interest was the heightened brain activity in the anterior insula that occurs when people make a risk-based decision in a painful emotional context. "It's very speculative but it seems when people are in a painful context they behave as if they are facing higher risk and so does their brain. In a sense this is true but the risk is unrelated to the actual decision they are making because the unpredictable pain has no impact on the decision outcome. Nevertheless the brain reacts and we behave as if the painful context and the decision are connected."

Professor Fehr is very positive about the first set of results, not only in terms of its implications for identifying neural pathways for decision-making, but also of its contribution to a wider theory of emotions and social decision-making. "We have high hopes for this project and the insights it can provide," he says. "There are many forces that drive our decisions but we have no unifying account. By looking at how our decision-making changes depending on emotion and social context we hope to gain a deeper understanding." ■

INTERVIEW



iEEG and Emotions conference – 19th – 21st September

2012

Prof. Didier Grandjean



Dr. Julie Péron

This autumn the NCCR Affective Sciences organised a groundbreaking conference on human intra-cerebral recording and emotions. Gathering experts from the forefront of the field, the conference showcased state-of-the-art research and launched collaborations between researchers and clinicians for future work. Professor Didier Grandjean and Dr Julie Péron were on the organising committee, alongside with representatives from the University Hospital of Geneva and the Interfaculty Centre in Neuroscience.

Intracranial electro-encephalography (iEEG) is the recording of the electrical activity of groups of neurons through electrodes placed directly into the brain tissue. Recordings are taken as part of clinical procedures from a range of patients such as those with Parkinson's disease and epilepsy, and the recordings can provide insight into the cerebral basis of cognitive functioning and notably emotional processing. "iEEG is a clinical procedure that is used to trace the neural activity of patients and to monitor surgery," explains Dr Péron. "But it can also be used to look at some fundamental questions at the seat of neuroscience and affective neuroscience."

The event reflected the true meaning of the word 'conference': bringing together different disciplines, ideas, methods and models. It took place over two and half days and was organised into several sessions covering both clinical and academic aspects of iEEG with respect to emotions. The opening session was dedicated to signal processing, which provided information on the latest advances in electrode recording methods in the brain and advanced signal analysis. "We thought it was important to include developments at both a conceptual and a methodological level," explains Professor Grandjean. "So the opening session was on signal processing and then we organised the following research sessions around the multicomponential model of emotion, to highlight how the different components can be studied using iEEG methods." Alongside sessions on clinical considerations of iEEG, there were presentations on its use to study cognitive processes, decision-making, subjective feeling, facial emotional processing and auditory emotional processing.

With more than 20 speakers and over 100 delegates from Europe, Asia, Australia, Africa and North America, the conference generated a wide-reaching interest, especially as it was the first dedicated to intracranial recordings and emotional processing. Its inspiration came from a literature review conducted by Dr Péron and Professor

Grandjean. "I was asking myself a lot of questions related to the papers that I was reading," says Dr. Péron. "So primarily we decided to hold a conference to address these questions directly to the researchers and ascertain some collective viewpoints. However we soon realised the conference could also provide the opportunity to develop new international collaborations, notably in order to pool data from patients for future research to give us larger samples and improve statistical robustness."

The conference also provided a platform to discuss some cutting edge ideas about how different populations of neurons 'talk' to each other. "We call this cross-frequency coupling," explains Professor Grandjean. "And we plan to develop new methods to quantify the relationship between the oscillations of neuronal populations at the sub-cortical level and oscillations at the cortical level. The hope is to gain a more holistic and systemic understanding of how emotional sub-cortical areas communicate with cortical areas to link perception to action. For example how the amygdala communicates with the auditory cortex to drive attentional capture."

On the clinical side there were equally exciting developments with presentations on a new proposed procedure for chronically depressed patients using deep brain stimulation of the ventral striatum. "This is a structure which is known to be involved in the reward system and decision making," says Dr. Péron. "So we will be able to record neuronal activity directly from the ventral striatum in response to emotional stimuli during this procedure." The conference has already launched several initiatives to assemble and disseminate existing research. "We are planning to communicate the research presented at the conference and the state-of-the art in this domain in a special issue in the journal *Cortex*, which has already been accepted by the editorial board," says Dr Péron. "And next year we would like to submit a symposium on iEEG and Emotions at the Society for Neuroscience annual conference." This conference is the largest on neuroscience with over 30,000 delegates and the symposium will consist of a series of six short oral communications. In terms of future research the 'iEEG and Emotions' conference has also opened innovative directions and stimulated several national and international collaborations. "This will allow us to conduct a new series of studies," says Professor Grandjean. "So we can improve our understanding of emotional processing in humans." ■

NEWS

Academic meetings

Changing The Brain, Changing The Society: Clinical And Ethical Implications of Neuromodulation Techniques In Neurology And Psychiatry (June 13-14, 2012, Fondation Brocher, Geneva). Workshop organized by David Sander and Patrik Vuilleumier at the International Symposium on Neuroscience and Ethics on ethical challenges raised by new approaches to measure and influence brain functions, including emotions.

L'expression des émotions chez Shakespeare et ses musiciens (June 15-16, 2012, Geneva). Interdisciplinary workshop organized by Klaus Scherer and Bernardino Fantini in collaboration with the Grand Théâtre de Genève in conjunction with the performances of Verdi's Macbeth, exploring the treatment of the emotions in Shakespeare's play and Verdi's opera.

The Nature of Desire (June 26-28, 2012, Geneva). Julien Deonna and Federico Lauria organized this conference on the nature of desire, with the participation of the most important philosophers working in the field. Peter Railton was one of the keynote speakers at the conference. An edited volume, drawing on the conference proceedings, is planned for 2014. (http://www.unige.ch/lettres/philo/thumos/Thumos/The_Nature_of_Desire.html).

Negotiation and Emotion (July 10, 2012, Geneva). Workshop organized by Klaus Scherer with the collaborators of the Negotiation and Emotion project (NEMO: an interdisciplinary study on individual differences in socio-emotional skills in relation to dyadic negotiation) to discuss theoretical underpinnings and first results.

Towards an Ontology for Mental Functioning (July 22, 2012, Graz, Austria). Janna Hastings co-organized and participated in the interdisciplinary workshop on challenges and progress in ontologies for mental functioning and emotions. The workshop was well attended with representation by experts from neuroscience, neuroinformatics (NIF), psychology, philosophy, psychiatry and biology (<http://kr-med.org/icbofois2012/mfo/>).

International Summer School in Affective Sciences 2012 (ISSAS 2012): Art, Aesthetics & the Emotions (August 22-30, 2012, Bogis-Bossey, Switzerland). ISSAS 2012 brought together and integrated the multiple and complementary ways of investigating the relations between the arts

and the emotions. Major scholars in the areas of aesthetics and emotions were invited to present and discuss fundamental theories, cutting-edge methodologies, and major research paradigms and results (<http://affective-sciences.org/issas>).

What does human intracerebral recording tell us about emotions? (September 19-21, 2012, Geneva). International colloquium organized by Didier Grandjean, Patrik Vuilleumier, Julie Peron and Arnaud Saj on how intracranial electro-encephalography (iEEG) can help cognitive neuroscientists, psychologists, and neurologists to understand the neural basis of emotional processing in humans (<http://www.affective-sciences.org/node/3077>).

Le Groupe d'Étude et de Recherche sur les Métaphores Musicales (GERMM). (September 24-25, 2012). This new research project around the musical gesture is a collaboration involving the NCCR Affective sciences, and the Haute Ecole de Musique de Genève. Workshops and experimentations will be organized all along the year (<http://www.germm.org/recherche/gestuaire/>).

Perceptual Ephemera (September 24-26, Geneva). Conference organized by Clare Mac Cumhail. Fourteen new and established theorists from across the globe (UK, US; Mexico, Japan, France, Greece, Switzerland) were invited to present research on lesser theorized objects of perception, including stuffs, absences and values. An edited volume, drawing on the conference proceedings, is planned for 2014 (http://www.unige.ch/lettres/philo/thumos/Thumos/Perceptual_Ephemera.html).

Symposium on Neurobiology of Attachment (October 12, 2012, New Orleans, USA) Patrik Vuilleumier and Pascal Vritcka organized a symposium on psychological, neural and biological foundations of attachment at the Annual Meeting of the Society for Social Neuroscience.

Symposium on Emotion-Cognition interaction (October 16, 2012, New Orleans, USA). Symposium on relations of cognitive control with emotion perception and social cognition, co-organized by Leonie Koban at the Annual Meeting of the American Society for Neuroscience. ■

Academic meetings

SIEMPRE meeting - International Workshop on Social Behaviour in Music (October 26, 2012, Santa Monica, USA). Didier Grandjean and Kim Torres-Eliard co-organized and participated in this workshop as a satellite event of the 14th International Conference on Multimodal Interaction (ICMI 2012, <http://www.acm.org/icmi/2012/>).

Colloquium on Aesthetic Emotions (October 26-27, 2012, Free University of Berlin, Germany). Klaus Scherer participated as an invited speaker in this colloquium on emotions in response to exemplars and the extraordinary.

Workshop on Current Emotion Research (November 8, 2012, Bonn, Germany). Klaus Scherer was the invited keynote speaker at this workshop organized by Rainer Banse which brought together doctoral students from Germany and Switzerland working on emotion topics.

Geneva Colloquium on Music and Emotion: Evolution, history, and neurobiology (November 14-17, 2012, Geneva). Academic symposium organized by Klaus Scherer, Bernardino Fantini and Eduardo Coutinho (<http://www.affective-sciences.org/event/GCME>) in conjunction with the Festival "Musiques & Sciences" (www.femusci.org). Topics included the evolution of music from emotional expression, music-emotion interactions in the course of history, neuroscience research on music-induced emotions, emotion in the singing voice, and the "singer's paradox" (feigning or experiencing emotions in the performance).

Conference on 'Antirealism in metaethics: Expressivism, relativism and error theories' (December 11, 2012). Four speakers presented their most recent research in metaethics at the University of Geneva. A Workshop on expressivism (December 12-13, 2012) will take place at the University of Fribourg. The same four speakers will present their work on a specific version of antirealism, namely expressivism. (<http://www.philosophie.ch/events/single.php?action=date&eventid=939&month=12&year=2012>). ■

Alain Pé-Curto (Project "Emotion, Feeling and Values") was awarded a Swiss National Science Foundation (SNSF) Prospective Researcher fellowship to pursue his research at Rutgers University Department of Philosophy, New Brunswick (October 2012).

Ernst Fehr (Project "The impact of emotional cues on pro-social behavior and norm compliance") was awarded an European Research Council (ERC) Advanced Investigator Grant amounting to 2.49 M for the research project "Foundations of Economic Preferences".

Didier Grandjean (Project "Neural mechanisms of emotional response patterning and system synchronization") obtained a grant (3 years, CHF 441'628.-) from the Swiss National Science Foundation (SNSF) on a research project on the functional specialization and integration of the basal ganglia in human emotional prosody decoding.

Iona Latu (Project « Emotion and Gender under a Power Perspective ») was awarded an Ambizione post-doctoral fellowship from the Swiss National Science Foundation (SNSF) for three years, for the research project "Implicit gender stereotypes in the workplace context: communication, behavioral confirmation, and detection".

David Sander and **Tobias Brosch** (Project « Affective relevance : Nature, determinants and effects ») obtained a grant (CHF 234'120) from the Swiss National Science Foundation (SNSF) to investigate the neuro-cognitive mechanisms underlying the processing of goal-relevance.

Mohammed Soleymani (Project "Affective computing and emotion awareness in computer-mediated interaction") was awarded in 2012 a Marie Curie fellowship. He is currently at iBUG group (Prof. Maja Pantic) at the Imperial College London. ■

NEWS

Major Achievements

Alain Pé-Curto (project “Emotion, Feeling and Value”) was awarded the Prix Disdier de Philosophie Morale (Geneva).

Ernst Fehr (Project “The impact of emotional cues on pro-social behavior and norm compliance”) received the prestigious Gottlieb Duttweiler Award. This award goes to researchers having made «outstanding contributions to the well-being of the wider community”.

Marianne Schmid Mast (Project « Emotion and Gender under a Power Perspective ») and her collaborators Gaëtan Cousin and Nicole Jaunin-Stalder received an

award from the Faculty of Medicine of Basel University and the Sandoz group in recognition of the relevance of their work on gender for the field of general medicine.

Klaus Scherer (Co-Director and Project « Appraisal-driven patterning of emotional expression and experience ») received two honorary doctorates. On October 1, 2012 he received the «Dottore ad honorem in psicologia cognitiva applicata» from the University of Bologna and on November 7, 2012 the title of Dr. phil. honoris causa from the University of Bonn. ■

Knowledge transfer activities

An exhibition on the voice (June 19, 2012). Klaus Scherer was invited by the “Cité des Sciences et de l’Industrie” in Paris to participate in the preparation of a forthcoming exhibition on the voice. This major exhibition will explore the vocal mechanisms and their use in communication, including emotional expression.

Montreux Jazz Festival (July 4,5,13 and 14, 2012). Didier Grandjean, Kim Torres-Eliard, Wiebke Trost, Sascha Fruehholz, Antonio Camurri and Paula Niedenthal organized five workshops on Music and Emotions (<http://www.montreuxjazzfestival.com/2012/fr/festival/foundation2>).

La Nuit de la Science (July 7-8, 2012). For the fourth time NCCR researchers (Kornelia Gentsch, Caroline Lehr, Sarah Python, Kim Torres-Eliard and Delphine Warrot) participated in this popular-science event with four workshops. More than 500 people attended the workshops (http://www.ville-ge.ch/mhs/nuit_science.php).

Le Village des sciences (October 13-14, 2012, Guilhaingranges, France). Sandra Simoes, Indrit Sinanaj and Anna Zimmermann organized two interactive work-

shops on metacognition and emotional facial mimicry at this French popular-science festival (<http://www.arche-des-metiers.com/index.php>).

Laboratoire de Neuro/Sciences humaines (November 28, 2012). Sophie Schwartz with the philosopher Jacqueline Carroy participated in a series of dialogs, organized by the Hôpitaux Universitaires de Genève (HUG), between philosophers and scientists, proposed to academics and the general public.

Festival Musiques & Sciences (November 15-17, 2012; www.femusci.org). Klaus Scherer, Bernardino Fantini and Eduardo Coutinho created this new festival with the aim of bringing together scientists, composers, musicians, and an informed public. The festival was organized by the University of Geneva in cooperation with the Geneva Opera, the conservatories of Geneva and Lausanne, and the Concours de Genève. Additional partners were the University of Lausanne, the ‘Concerts d’été à Saint-Germain’, ‘Genève, the Ensemble Contrechamps’ and the Fondation Montreux Jazz 2. The program, consisting of colloquia, workshops, exhibitions and demonstrations, as well as concerts, attracted an enthusiastic public. ■

Staff changes

Christelle Gillioz (Focus “Language and Culture”) joined the Center on November 1, 2012 to work on the development of the GRID questionnaire in collaboration with Klaus Scherer, Johnny Fontaine and Cristina Soriano.

Christelle Bozelle (Project “Affective computing and emotion awareness in computer-mediated interaction”) joined the project on July 1, 2012 to work on the data collection, analysis and knowledge transfer of the Emotional Awareness Tool for Mediated Interaction (EATMI) project.

Dario Bombari (Project « Emotion and Gender under a Power Perspective »), from Columbia University, joined Marianne Schmid-Mast’s lab as a post-doc.

Daniel Burghart (Project “The impact of emotional cues on pro-social behavior and norm compliance”) joined the group as post-doc. His work focuses on building a neural model of the demand for public goods and methodological improvements in the valuation of non-market goods.

David Furrer (Project “Emotion, feeling and value”) left in September 2012.

Amanda Garcia (Project “Emotion, feeling and value”) joined Thumos on November 1, 2012 and started a post-doc within the interdisciplinary project “The impact of fiction on evaluative attitude”.

Raphael Guex (Project “Neural mechanisms of emotional response patterning and system synchronization”) joined the project as a doctoral student in January 2012.

Leonie Koban (Project “Cerebral bases of individual differences in affect perception and regulation”) left Patrik Vuilleumier’s lab. She is now working with Prof. T. Wager as a postdoc at the University of Colorado at Boulder.

Konstantina Kalogianni (Project “Affective computing and emotion awareness in computer-mediated interaction”) joined the project on August 1, 2012 to develop an emotionally adaptive game and help in the data collection of the project ‘Emotion Awareness Tools for Mediated Interaction (EATMI)’.

Clare Mac Cumhaill (Project “Emotion, feeling and value”) joined Thumos in February 2012 through the sub-project “Emotion, Intentionality and Perspectives” from the SNSF Sinergia project.

Marcel Meyer (Project “Cerebral bases of individual differences in affect perception and regulation”) joined Patrik Vuilleumier’s lab as a postdoctoral researcher.

Michele Ombrato (Project “Emotion, feeling and value”) joined Thumos on November 1, 2012 to conduct doctoral studies.

Swann Pichon (Project “Cerebral bases of individual differences in affect perception and regulation”) left Patrik Vuilleumier’s lab. He is now working with Prof D. Bavelier at the Faculté de Psychologie et des Sciences de l’Éducation (FAPSE) of the University of Geneva.

Marcin Posel (Project “Cerebral bases of individual differences in affect perception and regulation”) joined Patrik Vuilleumier’s lab on a Swiss-Polish PhD scholar-

ship.

Alain Pé-Curto (Project “Emotion, feeling and value”) will work as a visiting scholar at the Department of Philosophy of Rutgers University, in New Brunswick (NJ) from September 2011 to August 2013.

Vera Sacharin (Project “Appraisal-driven patterning of emotional expression and experience”) left the Center at the end of July 2012 to run her own Swiss National Science Foundation (SNSF) project at the University of Lausanne.

Petra Schmid (Project « Emotion and Gender under a Power Perspective) left in June 2012 on account of a Swiss National Science Foundation (SNSF) postdoctoral grant to conduct research at New York University.

Gil Sharvit (Project “Cerebral bases of individual differences in affect perception and regulation”) joined Patrik Vuilleumier’s lab as a PhD student.

Emma Tieffenbach (Project “Emotion, feeling and value”) joined Thumos in April 2012 as a postdoctoral researcher.

Wiebke Trost (Project “Cerebral bases of individual differences in affect perception and regulation”) left Patrik Vuilleumier’s lab. She is now working with Didier Grandjean (Project “Neural mechanisms of emotional response patterning and system synchronization”) as a postdoc.

Jacobiën van Peer (Project “Appraisal-driven patterning of emotional expression and experience”) left at the end of July 2012 to an Assistant Professor position at the University of Nijmegen, The Netherlands.

PhDs

Géraldine Coppin successfully defended her PhD thesis on June 29, 2012 on « The flexibility of olfactory preferences: Impact of decision-making processes » under the direction of David Sander.

Laure Freydefont successfully defended her PhD thesis on October 10, 2012 on “The Influence of implicit anger primes on effort mobilization » under the direction of Guido Gendolla.

Sophie Jarlier successfully defended her PhD thesis on June 8, 2012 on “The power of smell on human physiology and cognition: A thermographic approach of emotional processes” under the co-direction of Patrik Vuilleumier and Didier Grandjean.

Leonie Koban successfully defended her PhD thesis on September 17, 2012 on Social conflict monitoring under the direction of Patrik Vuilleumier.

Isabelle Pitteloud successfully defended her PhD thesis on November 3, 2012 on “Stendhal, Balzac, Flaubert : la théorie romanesque des émotions” under the direction of Patrizia Lombardo.

Wiebke Trost successfully defended her PhD thesis on July 27, 2012 on “Cerebral bases of music-induced emotions” under the direction of Patrik Vuilleumier. ■

Upcoming events

Workshop on Tools and Technologies for Emotion Awareness in Computer-Mediated Collaboration (January 28 – February 1, 2013 - Open Call for papers) Gaelle Molinari and Guillaume Chanel are organizing this workshop at the Alpine Rendez-Vous 2013 in collaboration with Denis Lalanne (University of Fribourg), Fabien Ringeval (University of Fribourg), Kristine Lund (University of Lyon) and Armin Weinberger (University of Saarland). The aim of the workshop is to build an international community around the project topic. (<https://metah.imag.fr/alpine-rendez-vous/home/>)

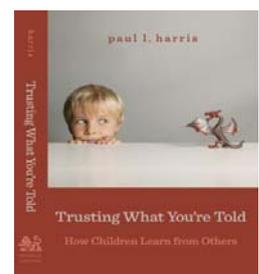
International Conference on 'The Ontology of Emotion' (April 25-27, 2013). This conference will bring together new and established theorists from both philosophy and psychology to interrogate the fundamental nature of emotional episodes and, particularly, the way in which they fill time. It will be held at the University of Geneva. (<http://www.unige.ch/lettres/philo/thumos/Thumos/Home.html>)

Interdisciplinary Conference on the Emotional Power of Music (May 16-17, 2013). The focus of this conference is the power of music to express, communicate and produce emotions (of any type), and its impact in everyday life. The program provides a multidisciplinary perspective on the field. It will be co-organized with swissnex San Francisco (<http://swissnexsanfrancisco.org/>) and it will take place in its premises.

New books

Paul L. Harris (2012). *Trusting what you are told – How children learn from others.* Belknap/ Harvard University Press.

Paul. L. Harris began this book during his sabbatical leave at the NCCR Affective Sciences in 2007.



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