

Affect & Emotion

Newsletter of the NCCR Affective Sciences

BRAIN NETWORKS
OF
EMOTIONS

EMOTIONS IN
PEACEBUILDING &
CONFLICT RESOLUTION



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EDITORIAL



Welcome to ISRE 2015 in Geneva!

We are extremely pleased to welcome the community of affective scientists in Geneva for the conference of the International Society of Research on Emotion (ISRE). In a few days, around 500 participants from over 33 countries will come to the University of Geneva (July 8th - 10th, with pre-conferences on the 7th). ISRE15 aims to provide an overview of the latest developments on the study of emotion, and the three day conference will offer more than 380 scientific communications, distributed over 3 plenary lectures, 150 symposium presentations, 82 talks and 147 poster sessions.

Please check the program on <http://www.isre2015.org/program>

Another recent key event for the Swiss Center for Affective Sciences was the official inauguration of the newly created Campus Biotech, where we are located. The inauguration took place on May 22nd in the presence of Johann N. Schneider-Amman, Federal Councillor, Anne Emery-Torracinta, State Councillor, Jean-Dominique Vassalli, Rector of the UNIGE, Patrick Aebischer, President of the EPFL, Hansjörg Wyss, President of the Wyss Foundation, and Ernesto Bertarelli, Bertarelli Foundation. The Campus Biotech Open Day, organized on May 23rd, was also very successful. The public was not only welcome to visit the campus and learn about the site history and aims, but could also meet researchers and discover our activities. More than 1000 people attended this event.

We are very proud to be the first occupants of the Campus Biotech, which now counts more than 400 people and that will continue to evolve and to grow!

Looking forward to welcoming you for ISRE2015 and many other events! ■

David Sander

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RESEARCH FOCUS



BRAIN NETWORKS OF EMOTIONS AND THEIR INFLUENCE ON COGNITIVE PROCESSES

Interview with Prof Patrik Vuilleumier on brain networks and emotion

We all know the power of emotions, but how do they influence our thinking and perception? And what happens when the impact of our emotions is no longer positive or helpful? A project at the NCCR Affective Sciences is using state of the art imaging analysis to identify the brain networks that are active during emotional experiences. By investigating how emotions function and interact with other processes in the brain, it aims to provide insight into the role of emotions in mental health problems such as depression and anxiety.

With the advent of functional magnetic resonance imaging (fMRI), emotional research no longer has to rely solely on our subjective reports of feelings but can apply scientific and objective measures to the activity of the brain. The project 'Brain Networks of Emotions and their Influence on Cognitive Processes' has applied fMRI and EEG to understand how emotions function and what networks they employ within the brain.

"By using imaging we can associate changes in brain activity with different emotional states," says project leader, Professor Patrik Vuilleumier. "This can make the somewhat private experiences of emotion more visible, measurable and comparable, helping to provide greater scientific weight to research in an area that was previously considered to be impossible to study objectively. For almost ten years, brain imaging was used to try to localize emotion in specific brain areas such as the amygdala, but we have now moved into a new phase where we are trying to characterize emotions in terms of networks and circuits. So we are no longer investigating just one brain area that may be instrumental in emotion but the interaction of different brain areas and the communication between them."

The project applies several methods to provoke emotions in volunteers whilst they are in the scanner. These include the use of music, films, pictures, sounds, and computer games. Previous research has tended to focus on the immediate effects of emotional experience, but the project is particularly interested in investigating the more long lasting impact of emotions to help understand the mechanisms of regulation and their dysfunction that may lead to mental health problems. "What is interesting is that we can understand how an emotional event will change the configuration of the brain in a lasting manner," says Professor Vuilleumier. "And this will then change the way we respond to new events, our thinking patterns and even the memories we retrieve, all of which in turn affect the emotional experience."

For instance, to investigate these long lasting emotional impacts, the project has used a gambling game where volunteers make various decisions whilst in an fMRI scanner. Once the outcome of their gamble is known, they are informed about whether another decision would have yielded better or worse results. This provokes an emotion of either regret or gratification, respectively. The study not only looked at which brain networks were active when these emotions were provoked, but also how long the activity was sustained and how much it varied with personality. The results suggest that those with a more depressed personality will experience less change in brain activity when they have made a good decision and the change will last a shorter time than those with a more positive outlook on life. "This could explain why an important component of depression is lack of motivation," explains Professor Vuilleumier. "And a lack of a positive assessment of your own achievements."

The current research has studied healthy volunteers and the next step is to investigate whether the same tendency occurs in people who have been diagnosed with depression or are at risk of depression due to family history.

"The long-term goal is to develop a measure that can help diagnose and perhaps distinguish between different types of depression and anxiety that are not currently captured by symptoms alone. Once the measure is developed, we would like to use it to evaluate treatments. We are also very interested in the regulation of emotion and have been using some measures of brain activity in real-time to provide feedback to help people influence their emotional reactions."

The different techniques employed by the project allow it to be very multidisciplinary in nature. Musicologists and experts in film have been involved to identify the features of art forms that influence our emotional experience, whilst philosophers have helped define the emotions themselves, particularly the more complex concepts such as guilt and shame. The project also involves neurologists and mental health specialists to contribute to the more practical applications. "Now brain imaging allows us to anchor the study of emotions in well defined brain circuits," comments Professor Vuilleumier. "We can complement this with expertise and knowledge from other areas to ensure we have a complete and comprehensive view of emotions." ■

INTERVIEW



Role of Emotions in Peacebuilding and Conflict Resolution

Dr Olga Klimecki

From a domestic dispute about housework to years of ongoing civil war, conflict is a pervasive and emotionally charged part of our lives. However there has been very little scientific study on the role of emotions in conflict and, perhaps more importantly, on interventions to prevent or ease conflict.

A new project on the 'Role of Emotions in Peacebuilding and Conflict Resolution' at the NCCR Affective Sciences plans to fill this gap. Not only will it investigate the theoretical underpinning of conflict but, by capitalising on its geographic location, it will also test practical applications with the help of the Geneva-based international organisations, businesses and non governmental organizations (NGOs) that deal with conflict.

Psychologist Dr Olga Klimecki, who is leading the project, has a background in the neuroscience of empathy and compassion. "For me what was revealing and intriguing was how little evidence-based science is used in resolving political conflicts," she says. "The main aim of the project is to provide a scientific basis to inform guidelines for politicians, international organizations, NGOs and businesses. There are very few scientific experts in this field and, apart from my personal expertise with everyday conflicts, I am a novice in this area. Therefore, it is so fascinating to collaborate with people who have years of experience working in a wide range of conflict situations around the world."

The project has adopted a wide definition of conflict that encompasses everyday quarrels between a few people as well as large-scale wars between nations and regions. "We believe that most conflicts are fueled by emotions," says Dr Klimecki. "We also know that human beings share common biological and neural mechanisms that play a role across a range of conflicts. It is these mechanisms that we are trying to investigate, define and eventually apply to create and evaluate ways to resolve conflict."

The project is taking several different approaches to studying this area. Dr Klimecki is already running laboratory studies to simulate conflict with computer games where volunteers play for economic resources within a context of injustice. Volunteers can play the game in front of a computer or whilst they are in an fMRI scanner. In the latter case, it is possible to analyze their brain activity when they become aggressive or use particular strategies to resolve disputes.

Another line of investigation uses more natural conflict by bringing together people with incompatible views on topics such as immigration to investigate the use of various interventions. These interventions include encouraging participants to take the perspective of others, using a neutral mediator to discharge conflict, and changing people's emotional state with a particular focus on minimizing distress.

Lastly the project plans to conduct various field studies and work with people who have experienced large-scale political conflict. "Currently we are hoping to carry out studies in Israel and the Democratic Republic of Congo," says Dr Klimecki. "In the long run, we hope that the work can be expanded to more regions to ultimately produce recommendations that could be used by communities and state leaders around the world."

By working at these different levels and involving other disciplines such as economics, law, political science and philosophy, the project aims to gain a holistic view of conflict by bringing together complementary expertise. Already the laboratory studies are yielding results and demonstrating that personality plays an important role in our reaction to conflict, where those who can take the perspective of others and show concern are more likely to forgive in conflict situations. Results also show that distress is another important factor in how we handle conflict as it increases our tendency to be aggressive. "If people are not experiencing stress in other areas of their life, then their reaction to conflict is more constructive," explains Dr Klimecki. "We would like to investigate this in the field to see if we can reduce the stress of people and whether that has an impact on their conflict behavior."

There are many avenues that the project can investigate, but Dr Klimecki has a clear idea of its overarching goal: "My big hope is that we can contribute to conflict resolution using meaningful scenarios that we can test both in the laboratory and the field. I think one central condition or pre-requisite for this is to work with people with different expertise because the central objective of the project is to have results that will be applicable. So my long term goal is that our results will not end up in a drawer but will change the way people talk to each other and solve conflicts." ■

Grants received

Tobias Brosch obtained the SNSF Assistant Professor Energy Grant to work on energy-related decisions and behaviors (2015-2019).

Elena Cañadas (Gender Focus) got financial support from HEC Research Fund for the project “Dictated by emotions: Memory biases beyond gender stereotyping” (April-December 2015).

Corrado Corradi dell’Acqua (project Brain Networks of Emotions and their Influence on Cognitive Processes), **Sascha Fruehholz** (project From Elicitation to Emotional Response: Neural Mechanisms of Patterning and System Synchronization) and **Fabrice Teroni** (project Emotion, Attention and Value) were awarded a SNSF Professorship with the following projects: Sascha Fruehholz, project on Neurocognitive Mechanisms of Auditory Perception - Challenging The Human Auditory System at The Limits of Hearing (start September 2015, University of Zürich); Corrado Corradi dell’Acqua, project on Cognitive and Neural Systems for Understanding Others and their Somatic States (start September 2015, University of Geneva), Fabrice Teroni, project on Modes and Contents (start September 2015, University of Fribourg).

Federico Lauria (project Emotion, Attention and Value) was awarded the “Columbia University Italian Academy for Advanced Studies in America Fellowship” for his project “What Emotions Can Teach us About Music: Cognitivism, Musical Expressiveness and Musical Emotions”, Columbia University, (January-May 2016).

Alain Pe-Curto (project Emotion, Attention and Value) was awarded the Philibert Collart 2015 fellowship (Société Académique de Genève) in May 2015.

Eva Pool (project Affective Relevance) was awarded an SNSF early postdoctoral fellowship in order to conduct her research project at Caltech with Professor John O’Doherty (2015-2017).

Franziska Tschan and Norbert Semmer (with Guido Beldi and Daniel Candinas) (project Work and Emotions) received an SNSF grant on the “Impact of structured communication in the operating room on surgical site infections” (2015-2018).

Martial Van der Linden (with Paolo Ghisletta as a main applicant) (project Emotional Future Thinking) received an SNSF grant on «Understanding and promoting goal-directed behaviors in older adults» (2015-2018) ■

Completed PhDs

Jean-Marc Gomez successfully defended his PhD thesis on “Exploration et prise en charge des problèmes d’adaptation sociale et comportementale chez l’enfant et l’adolescent scolarisés” on February 5, 2015 under the supervision of Martial Van Der Linden and Stephan Eliez ■

On our website www.affective-sciences.org

Research materials are available at <http://www.affective-sciences.org/researchmaterial> Free of charge for non commercial research projects.

Online Platform on Emotional Competence at <http://www.affective-sciences.org/ec>, including the major contributions and debates in the literature on emotional intelligence, potential applications, as well as results of the most recent research ■

Social Media

Emma Tieffenbach (project Emotion, Attention and Value) launched a Video on IJPHM (International Journal of Health Policy and Management) Youtube Channel about “The Cost of Shame” <https://www.youtube.com/watch?v=beTXvgcrCWA> ■



Follow us on Twitter : @NCCRAffectiveScience ■

Upcoming events



ÉMOTIONS – une histoire naturelle

(Muséum d’histoire naturelle de Neuchâtel, November 30, 2014 – December 31, 2015). The NCCR Affective Sciences has developed in close collaboration with the Museum of Natural History of Neuchâtel a major exhibition entitled “Emotions... naturally”. Workshops, conferences and public events have been planned throughout the year (www.museum-neuchatel.ch). Upcoming dates in the frame of the exhibition: conferences by Prof Patrizia Lombardo (5 July 2015) and Dr Swann Pichon (4 July 2015) at **Neuchâtel International Fantastic Film Festival (NIFFF)**, <http://www.niffff.ch/>.



Montreux Jazz Festival

(July 4 and 14, 2015). The NCCR Affective Sciences will organize three workshops on music and emotion, one of them in collaboration with the Haute Ecole de Musique de Genève (HEM) (July 14, 2015). On July 4, a NCCR philosopher will give a perspective on Steve Reich’s Different Trains from a philosophy of music point of view <http://www.montreuxjazzfestival.com/fr/programme15/gratuit?place=569> he



ISRE 2015

The next edition of the conference of the International Society of Research on Emotion (ISRE 2015) is being organized by the Swiss Center for Affective Sciences and will take place in Geneva from July 8 to 10, 2015, with pre-conferences on the 7th. www.isre2015.org.

14th biannual congress of the Swiss Psychological Society (SSP/SGP)

(September 8-9, 2015). Martial Van der Linden (project Emotional Future Thinking) will organize two symposia entitled “A multidimensional approach to impulsivity : Illustrations in psychopathology and neuropsychology” (Chairperson: Lucien Rochat) and “Future thinking: From underlying processes to goal-related functions” (Chairperson: Catherine Barsics). For further information: <http://www.ssp-sgp2015.ch/cms/home>

Addiction and Psychopathy Workshop

(September 29, 2015) organized by the project “Emotion, Attention and Value” and the E&T Program of the Center with the participation of Dr Hanna Pickard, Department of Philosophy, University of Birmingham ■

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