

Affect & Emotion

Newsletter of the NCCR Affective Sciences



RESEARCH FOCUS

Comparative study in emotion:
The case of emotional
vocalizations of humans and apes
Interview with
Prof. Didier Grandjean and
Dr Thibaud Gruber

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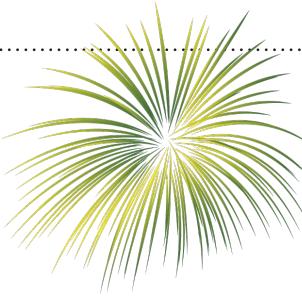
Dissecting, detecting and
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EDITORIAL



Happy new year! 2017 will be an important year for the NCCR Affective Sciences: from 18 to 20 May we will celebrate our first 12 years of fruitful research on emotion!

This celebration signals the official conclusion of the NCCR period, but the Swiss Center for Affective Sciences remains at the University of Geneva! Indeed, thanks to the institutional developments allowed by the NCCR during more than 10 years, the field of the Affective Sciences in Switzerland is stronger than ever, and the Center will continue to coordinate research projects and teaching activities.

Come and celebrate with us!

On Thursday 18 and Friday 19 May 2017, the Center will host an international scientific conference aimed at presenting the scientific community with our research projects and scientific advances. This conference will feature the project leaders of the NCCR, as well as invited international speakers. Together they will present and comment on the significance of the results of the research carried out at the NCCR in the past 12 years.

On Saturday 20 May 2017, in the framework of Geneva's Nuit des Musées, our Center opens its doors at the Campus Biotech for a public event for all audiences, including families. Our researchers will showcase in an accessible and entertaining fashion the research conducted at the NCCR. Do not miss this opportunity to see, for example, how the brain processes emotion, how people communicate feelings with their faces, voices and movements, and what emotions can be expressed with chocolate!

We look forward to meeting you there! Please find the program and information on www.affective-sciences.org/cisa2017

I am also very pleased to announce that the Swiss Center for Affective Sciences has edited a beautiful Art and Science photography book on the topic "Emotions".

Finally, the Newsletter showcases, as always, some of the research carried out at the Center. This issue describes research on Vocalization and Primates that combines the expertise of Prof. Didier Grandjean and Dr Thibaud Gruber. The issue also contains an interview of Prof. Corrado Corradi dell'Acqua who presents his latest research on pain. Of course, the Newsletter also contains the latest information on the Swiss Center for Affective Sciences.

I wish you all a very emotional 2017!

David Sander ■

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COMPARATIVE STUDY IN EMOTION: THE CASE OF EMOTIONAL VOCALIZATIONS OF HUMANS AND APES

Interview with Prof. Didier Grandjean and Dr Thibaud Gruber



The similarity of humans and other animals has been the subject of debate for many years. Central to this discussion is the comparison of human emotions to those of our closest relatives: the nonhuman primates. However, this research area has tended to be neglected, probably due to the difficulty to address this comparison with a systematic approach.

Professor Didier Grandjean and Dr Thibaud Gruber are combining their skills to enable comparative research with primates on emotional vocalization. Dr Gruber is a primatologist, working on the culture and communication of great apes, including bonobos, chimpanzees, and orangutans, whilst Prof. Grandjean is an expert on the brain areas and functional networks involved in emotional vocalisation. One of the major outputs of their collaboration so far is a review and opinion article on the neural bases of emotions and vocalisations in primates, which is in press in *Neuroscience and Biobehavioral Reviews* journal. The aim of this paper is to address whether the emotional states or processes of nonhuman primates are comparable to those of humans by assessing existing research on the brain areas and networks involved.

"The idea was to bring together research on vocalizations and research on emotions in primates," explains Dr Gruber. "People have either been interested in vocalization with a direct link to human language, or they have been interested in emotions and their connection to human feelings. But the link between the two hasn't really been studied explicitly and this is what we wanted to do."

The review highlights the existence of similarities between humans and primates when producing or receiving emotional vocalizations. These include similar patterns in the lateralization of the brain and in the activation of an area called the superior temporal sulcus. In addition the review indicated a level of control and intention in the emotional vocalizations of nonhuman primates that hasn't been addressed sufficiently when making the comparison to humans.

"Some researchers in the field assume that the vocalizations of animals are fixed," explains Prof. Grandjean. "That is they simply produce an automatic response to a stimulus with no system to categorize emotions and vary their vocalizations accordingly. However there is evidence in the literature that animals can adapt their vocalizations and change the sounds they make according to the context or audience."

The review provides various instances of this intentionality, mostly taken from behavioural studies. For example, wild chimps can control their production of the 'snake hoo'

which is an alarm call to inform others of the presence of the snake, altering the call depending on whether their fellow chimps have previously seen the snake or not.

"Actually there is a spectrum of intentionality which is not so different to that in humans," remarks Prof. Grandjean. "Some of our vocalizations can be quite innate, for instance when someone yells if they are pushed, this is not a controlled or intentional vocalization."

Grandjean and Gruber are planning to focus on this aspect of intentionality in future research. They would like to compare brain activation during vocalizations in apes and in humans to see if there are similarities in how this intentionality occurs and the level of organization within the brain that enables it. They are also interested in how humans can categorize the emotions of apes from their vocalizations and vice versa using near-infrared-spectroscopy (NIRS). This is a non-invasive assessment of brain function that is often used with children and restricted to measuring cortical regions. However, deep brain structures are not accessible with this technique.

Indeed, one of the major challenges of the research is that it is not possible to use the same methods to assess brain activation in humans and nonhuman primates. In particular MRI and PET scans are not allowed because they would involve restraining the apes, or performing these measures on anesthetized chimps.

"This level of protection is completely right," explains Dr Gruber. "What we need to do is adapt our techniques. Ideally we would like to develop a non-invasive research tool that allows us better access to brain activity and we are currently exploring the possibilities to adapt brain imaging techniques to measure such activity in apes."

One of the major applications of Grandjean and Gruber's research is to provide information on the emotions of non-human primates to inform the area of animal welfare. They hope that by conducting this type of lab-based research alongside the cultural insight of behavioural observation studies, they will provide a firm scientific basis for ethical decisions made by governments and agencies. "The purpose is to really give animals a fair trial so judgements on animal welfare are based on good data," explains Dr Gruber.

However observational research in the wild is also facing a challenge as nonhuman primate groups that have been studied for many years are now losing their habitat to deforestation. If a group of studied primates are wiped out, this means important cultural comparisons between other groups can no longer be made. By ensuring this area of research receives prominence, the work of Grandjean and Gruber can not only enable the protection of animals themselves, but also the rich legacy of research in this area. ■

INTERVIEW



Dissecting, detecting and managing pain Interview with Professor Corrado Corradi dell'Acqua

Pain is a very personal and individual experience, and the same is true for others' perception of this pain. As such, finding an objective measure of this concept is a valuable exercise for emotion research, but also a challenging one.

At the University of Geneva, Prof. Corradi-Dell'Acqua has taken up this challenge with the aim of advancing both our fundamental understanding of pain, but also to develop applications like improving pain management amongst healthcare providers. "The event that harms one's skin and stimulates pain pathways to the brain is one thing," explains Prof. Corradi-Dell'Acqua. "But how you subjectively experience this pain is a totally different aspect. The same event can be painful today and manageable tomorrow, depending on the context and the individual. This gap between the physical event and the subjective experience is unclear but fascinating, and important to explore."

It is this fascination that has motivated Prof. Corradi-Dell'Acqua to study the neurological, behavioral and psychological mechanisms of pain. In a recent research paper, he used functional magnetic resonance imaging (fMRI) to investigate to what extent the brain mechanisms behind the experience of pain are different from those associated with other equally unpleasant experiences, such as disgust. This would allow a distinction between the neural signalsthat represent pain specifically from those that represent a broad 'unpleasantness'. Interestingly, it seems that both kinds of representations exist in the brain.

"This may seem a very theoretical distinction," says Prof. Corradi-Dell'Acqua. "But you don't want to diagnose pain when someone is actually sad or disgusted and make a wrong classification. This is important practically as we need to be able to distinguish pain from other emotions to be sure we are measuring the right thing!"

In another strand of research, Prof. Corradi-Dell'Acqua is using the concept of theory of mind to explore how we represent the pain of others. "Theory of mind is essentially our personal model or knowledge about how others' minds work," explains Prof. Corradi-Dell'Acqua. "Compared with other emotions, it seems when we make inferences about pain we are less reliant on our beliefs about what is going on in their mind, and more reliant on our beliefs about what actually happened to them."

Again, this is important as a theoretical grounding

for more applied research. In particular it lies at the core of a study on the prescription of painkillers that Prof. Corradi-Dell'Acqua is leading in collaboration with the Hospital of Lausanne. The research team is collecting data from brain scans of nurses who prescribe painkillers, and measuring different aspects relating to empathy, how they deal with pressure and how they react to errors and risk. Alongside this, the team have access to electronic records of the nurses' clinical behavior, for example how often they document pain on clinical charts and how many times they prescribe painkillers.

"Healthcare providers tend to underestimate reports of pain and be conservative in their prescription of painkillers," says Prof. Corradi-Dell'Acqua. "However there is great variation between individual nurses and my hope is to try to understand what is driving this variability and use this information to improve training, which might then remove the bias in decision making. For example if we discover that a key factor in the variation of why and how nurses prescribe painkillers is the fear of making an error then we can make sure training addresses this aspect."

Although deeply involved in this applied research project, Prof. Corradi-Dell'Acqua does not wish to discontinue his previous work on fundamental cognitive neuroscience. "I think it is important to keep working on basic research," explains Prof. Corradi-Dell'Acqua. "Because if you lose track of the origins of your research then you also risk losing a theoretical grounding. I believe research must keep in touch with translational possibilities, but I also believe that researchers must stay connected with their theoretical roots."

Prof. Corradi-Dell'Acqua also applies a pragmatic and balanced view to the search for a diagnostic tool for pain that is not biased by the subjective point of view of a healthcare provider. Although this is a large part of his work, he is also realistic about finding a measure that is both objective and practical to implement. "There is a team in the US who have developed a complex algorithm that can predict pain reports from fMRI scans of patients," he explains. "And although I think it's wonderful that neuroscience research is developing in this direction, I also believe that what we need are quick, repeatable and cost-effective decisions, and currently only human observers can provide that. That is why I think that, rather than removing the subjective factor from pain diagnosis, we should study where professional healthcare providers vary the most, in the attempt to correct and optimize their decision process." ■



Completed PhDs

Soizic Argaud successfully defended her PhD thesis on « Reconnaissance et mimétisme des émotions exprimées sur le visage : vers une compréhension des mécanismes à travers le modèle parkinsonien » on November 7, 2016 under the direction of Prof. Didier Grandjean and Prof. Paul Sauleau (University of Rennes – France).

Mathieu Chatelain successfully defended his PhD thesis on “The role of implicit fear in the process of mental effort mobilization”, on July 14, 2016, under the direction of Prof. Guido Gendolla.

Andy Christen successfully defended his PhD thesis on “Neural dynamics of social threat processing through intracranial recordings of the human amygdala and orbitofrontal cortex” on November 4, 2016, under the direction of Prof. Didier Grandjean.

Kimberly Doell successfully defended her PhD thesis on “How impaired social functioning contributes to the pain of borderline personality disorder”, on November 3, 2016 under the direction of Prof. Sophie Schwartz.

Joanna Moussaly successfully defended her PhD thesis on “Biais cognitifs et attitudes envers l'image du corps chez les jeunes femmes”, on December 19, 2016, under the direction of Prof. Martial Van der Linden.

Marie My Lien Rebetez successfully defended her PhD thesis on “Vers une approche dimensionnelle, multifactorielle et intégrative de la procrastination”, on November 14, 2016, under the direction of Prof. Martial Van der Linden.

Gil Shlomo Sharvit successfully defended his PhD thesis on “Expectancy effects of pain & disgust in perceptual and moral decisions”, on November 30, 2016, under the direction of Prof. Patrik Vuilleumier and Prof. Corrado Corradi dell'Acqua.

Vanessa Siffredi successfully defended her PhD thesis on “Neuropsychology and functional brain organisation of working memory in children and adolescents with agenesis of the corpus callosum”, on December 5, 2016, under the direction of Prof. Pierre Barrouillet and Prof. Patrik Vuilleumier.

Indrit Sinanaj successfully defended her PhD thesis on “Confidence in decisions and actions: Behavior, brain circuits and disorders” on November 21, 2016 under the direction of Prof. Sophie Schwartz and Prof. Patrik Vuilleumier.

Joséphine Stanek successfully defended her PhD thesis on “A journey to the centre of motivational intensity theory: Studies on the theory's energy-related predictions”, on September 6, 2016, under the direction of Prof. Guido Gendolla.

Delphine Warrot (project Influence of Emotional Relevance and Sleep on Learning and Future Decision Making) successfully defended her PhD thesis on “Neural correlates of the influence of mood states on perception and decision making”, on June 20, 2016, under the direction of Prof. Sophie Schwartz. ■

Upcoming events

“Pas de Panique – La peur, notre meilleure amie ou notre pire ennemie ?”

(until April 23, 2017) An exhibition produced by Dr Mona Spiridon and Pierre-Yves Frei of the University of Geneva (with the support of the NCCR Affective Sciences) in collaboration with the University of Zürich at the Musée de la Main in Lausanne. (<http://www.museedelamain.ch/>)



Vive Stendhal (February 3, 2017). Workshop organized at the University of Geneva (UniBastions, Aile jura A 109) by Prof. Patrizia Lombardo. A group of researchers will present talks and will discuss Stendhal and his theory of emotions.

Art, imagination and mental states (March 10, 2017). Interdisciplinary colloquium organized at the University of Geneva (Uni Bastions, B111) by Prof. Patrizia Lombardo on the nature of our engagement with works of fiction.

Semaine du Cerveau - “En quête d’émotions” (March 13 to 17, 2017). This year, the Geneva Brain Awareness week’s theme will be focused on Emotions. Several researchers of the Swiss Center for Affective Sciences will give talks.

Narration et invention en littérature et cinéma (March 24, 2017). International colloquium organized at the University of Geneva (Uni Bastions, B111) by Prof. Patrizia Lombardo. European and Swiss speakers will give talks on the topic of fictions.

Minisymposium on Sleep and Neural Decoding (March 2016) A minisymposium on sleep and neural decoding will be organized by Prof. Sophie Schwartz as part of a series of departmental minisymposiums. Information on <http://www.addictionscience.unige.ch/seminaires/>.

Montessori, neurosciences et apprentissages – Outils, ateliers, saviors et savoir-faire (Paris, May 23,24,25, 2017 – Vevey, August 23,24,25 2017 and October, 18,19,20, 2017). Continuing Education courses organized by A.N.A.E. (<http://www.anae-revue.com/>) with the participation of Prof. Edouard Gentaz, Prof. David Sander, Solange Devernaud.

NEWS

Upcoming events

NCCR Affective Sciences Phasing Out Events (May 18 to 20, 2016).

The NCCR Affective Sciences celebrates its 12 years of research on emotion, **Come and celebrate with us!** We have organized two events :

On Thursday 18 and Friday 19 May 2017, the Center will host a scientific conference featuring the project leaders of the NCCR and a selected group of invited international speakers.

On Saturday 20 May 2017, in the framework of Geneva's Nuit des Musées, our Center opens its doors at the Campus Biotech for a public event for all audiences, including families.

Complete Program on www.affective-sciences.org/cisa2017 ■

Awards and grants

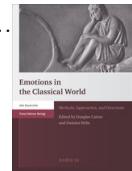
Ernst Fehr was awarded an honorary doctorate from the Karl-Franzens-Universität Graz (Austria) on November 29, 2016.

Fabrice Teroni was granted a three year (2016-19) SNSF project entitled "Knowledge, Action, and Factive Mental States".

Thierry Pun was elected member of the Swiss Academy of Engineering Sciences (SATW, <http://www.satw.ch/>) for his contribution to promoting Switzerland as a centre of science and technology, in particular in the field of computing. ■

NEW BOOKS / SPECIAL ISSUES

Emotions in the Classical World - Methods, Approaches, and Directions. Douglas Cairns (Hrsg.), Damien Nelis (Hrsg.) Stuttgart: Steiner-Verlag, 2017. ■



Artists in Labs: Recomposing Art and Science (2016). Publication featuring 8 art/science reports on artists-in-labs residencies from 2010/2011, with essays from Irène Hediger, Jill Scott, Lisa Blackman, Jens Hauser, Harriet Hawkins, Dieter Mersch, Arnd Schneider and Susanne Witzgall. Edited by Irene Hediger and Jill Scott. The Swiss Center for Affective Sciences hosted Jeremie Gindre for a residency in 2011. David Sander, Didier Grandjean and Sophie Schwartz give in this book their point of view on this collaboration. Published by De Gruyter.

Les Chants du monde – Le paysage sonore de l'ancienne Mésopotamie. Anne-Caroline Rendu Loisel. Toulouse : Editions PUM (Presse universitaires du Midi), 2016. ■



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. ■

Other websites of interest

XPhi Replicability: <https://sites.google.com/site/thexphireplicabilityproject/> The XPhi Replicability project, coordinated by Dr Florian Cova, seeks to reach a reliable estimate of the replicability of empirical results in experiment philosophy.



Emotion Regulation Game : <https://sites.google.com/site/e3gamedesign/home> The emotion regulation researchers team regularly hosts play session at the Swiss Center for Affective Sciences (CISA) located at Campus Biotech, Geneva.

Sale Bête – Le Blog du Temps de François Jaquet: <https://blogs.letemps.ch/francois-jacquet/> Dr François Jaquet keeps a blog on the moral status of the animals. ■

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Affect & Emotion

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