Universität Wien

Research Platform Cognitive Science

Talks | Symposium | Workshop

Winter term 2017

Christoph Eisenegger

Department of Basic Psychological Research and Research Methods, University of Vienna

The role of the testosterone in human social interaction

About the talk

Hormones are assumed to have a powerful influence on our behavior, and the androgen hormone testosterone is believed to be associated with aggression. But does testosterone cause aggression in humans in similar ways, as it does in some non-human animal species? What other social behaviors does the hormone influence? My talk will shed light on recent progress in the area of human social neuroendocrinology by presenting data from genetic and salivary hormone studies as well as psychopharmacological studies using testosterone administration. Results show that the hormone is involved in the regulation of complex social behaviors ranging from fairness and cooperation to competitiveness and reactive aggression. It thus appears that the hormone´s role in human social interaction reaches way beyond its proclaimed simple role in promoting aggression.

About the speaker

Christoph studied neurobiology at the Swiss Federal Institute of Technology in Zurich until 2004, and then did a PhD at the Economics Department at the University of Zurich until 2009. Between 2010 and 2013 he worked as a postdoctoral researcher at the University of Cambridge, with the support of two fellowships from the Swiss National Science Foundation (3 years). In 2014 he was appointed Assistant Professor and he is the head of a WWTF Vienna Research Group for Young Investigators at the Faculty of Psychology, University of Vienna. Christoph's major research focus lies in the neurochemical basis of human social decision making. Besides the focus on testosterone, he investigates effects of the estrogen hormone estradiol, as well as neurotransmitter systems such as the dopamine and opioid systems. His research is characterized by an interdisciplinary approach connecting research areas such as behavioral economics and social psychology, with neuroscientific approaches such as neuroimaging and psychopharmacological drug challenges.

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Jonathan Delafield-Butt

Faculty of Humanities and Social Sciences, University of Strathclyde, Glasgow, Scotland, United Kingdom

Prospective Motor Agency: From primary intentions in utero to embodied narratives of meaning, and their disruption in autism

About the talk

In this talk I will examine the embodied, affective nature of human learning and development before it achieves linguistic expression, as a route to basic principles of agency in movement in social awareness, affective contact, and learning. Conscious human experience is first evident in purposeful movements of the body made in basic actions in utero. Even at this early stage, these actions require an anticipation of their future effect, and generate basic satisfaction on their successful completion. This constitutes the first form of knowledge, knowing ahead of time the effects of a particular self-motivated, self-generated action, and its likely affective value. Made in intersubjective engagement after birth, these basic actions serve to co-create embodied narratives, or shared projects of meaning-making with common purpose. These are first and foremost embodied, then become linguistic. In autism, new evidence demonstrates the subsecond timing and integration of basic motor agency is disrupted, thwarting consequent social engagement and learning. This emerging motor perspective in autism presents a strong embodied view of development, illustrates its importance when disrupted, and gives impetus for novel therapeutic routes that include embodied, motor rehabilitative strategies.

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- Anzulewicz, A., Sobota, K. & Delafield-Butt, J. T. *Toward the autism motor signature: Gesture patterns during smart tablet gameplay identify children with autism.* Sci. Rep. 6, doi:10.1038/srep31107 (2016).

About the speaker

Jonathan Delafield-Butt is Senior Lecturer in Child Development at the University of Strathclyde. His work examines the origins of human experience and the embodied foundations of development, especially in autism. He began research with a Ph.D. in Developmental Neuroscience at the University of Edinburgh,

then extended to Developmental Psychology in work on the embodied nature of infant learning and development at the Universities of Edinburgh and Copenhagen. He has held scholarships at Harvard University and at the Institute for Advanced Studies at Edinburgh for bridgework between science and philosophy, and has trained pre-clinically in Psychoanalytic Psychotherapy at the Scottish Institute for Human Relations. His research combines disciplinary perspectives (neuroscience, psychology, movement science) to present new evidence on the aetiology of autism spectrum disorder, and novel routes to therapeutic intervention.

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Giovanni Pezzulo

Institute of Cognitive Sciences and Technologies, National Research Council, Rome, Italy

Planning and the rat hippocampus - was Tolman right?

About the talk

More than 50 years ago, Tolman suggested that rats are cognitive creatures that plan routes to goals (not just associate stimuli to rewards). I will discuss recent neurophysiological findings and computational modeling studies that are shedding light on the putative neuronal underpinnings of deliberate forms of (spatial) choice and planning processes. More broadly, I will argue that studying deliberative spatial choices may help us understand how animals may "detach" from immediate action-perception dynamics and reuse their internal models for higher cognition, e.g., to anticipate action consequences, plan, and solve problems. First, I will review the role of "internally generated sequences" in the rat hippocampus: structured, multi-neuron firing patterns in the network that are not confined to signaling the current state or location of the animal, but are generated on the basis of internal brain dynamics. Neurophysiological studies suggest that such sequences fulfill functions in memory consolidation, augmentation of representations, internal simulation, and recombination of acquired information. Second, I will discuss from a computational perspective how internally generated sequences might support (spatial) planning, goal-directed choices, and (Tolman's) "vicarious trial and error", also pointing to open research questions. Finally, I will mention the broader relevance of these findings for our understanding of cognitive processing. I will discuss an embodied view of cognition, in which higher cognitive functions may be based on internal (generative) models permitting the internalization and successive re-enactment of patterns of agent-environment interactions. In this perspective, dynamical patterns of neuronal activity originally supporting situated interactions may become internalized - e.g., in the form of internally generated sequences in the hippocampus (and elsewhere) - to support "detached" cognitive processing such as flexible ("what if") deliberation and planning.

 References

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About the speaker

Giovanni studied philosophy in Pisa, Italy and successively received a PhD in cognitive psychology in Rome, Italy. He was researcher at the Institute for Scientific and Technological Research (ITC-IRST) in Trento and successively the Institute of Computational Linguistics (ILC-CNR) in Pisa. He is now researcher at the Institute of Cognitive Sciences and Technologies (ISTC-CNR) in Rome, Italy. He uses a combination of theoretical, computational and empirical methods to study cognitive processing in humans and other

animals, and to realize robots that have similar abilities. He is currently most interested in how animals (and possibly robots) may acquire higher cognitive skills on top of their abilities for situated interaction with the environment and other animals.

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CogSci Symposium "Action, Perception, and Prediction"

In the first CogSci Symposium of the Research Platform Cognitive Science at the University of Vienna our invited speakers and commentators from the fields of Psychology, Philosophy, and Biology will present their perspectives and jointly discuss a theme that has been viral in Cognitive Science throughout the past decade(s) - the relation of action, perception and prediction.

Three internationally renowned researchers – Chris Frith, Patrick Haggard and Anthony Little – will deliver the keynotes. Keynotes will be discussed and commented upon by six researchers from the Cognitive Science network at the University of Vienna. There will be plenty of time for our speakers to discuss the presentations and commentaries with the entire audience.

Register bindingly (free of charge) with cornell.schreiber@univie.ac.at until November 1, 2016 (limited number of places).

Keynote A | 9:30 – 11:30 am

"Evolution and the social perception of faces" by Anthony Little (University of Bath, UK)
Comments by Katrin Schaefer and Bernard Wallner (both Department of Anthropology, University of Vienna)

Keynote B | 1:30 – 3:30 pm

"Awareness of action: prediction or reconstruction" by Patrick Haggard (UCL, UK)
Comments by Ulrich Ansorge (Department of Basic Psychological Research and Research Methods, University of Vienna) and Michael Schmitz (Department of Philosophy, University of Vienna)

Keynote C | 4:00 – 6:00 pm

"Action, Agency & Responsibility" by Chris Frith (UCL, UoL, UK).
Comments by Katrin Schaefer and Bernard Wallner (both Department of Anthropology, University of Vienna)

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Anthony Little

Department of Psychology, University of Bath, UK

Evolution and the social perception of faces

About the talk

An evolutionary approach highlights that selection pressures will have shaped social perception to be functional. Behaviour is extremely complex and so it is unlikely that observers will always behave adaptively but an evolutionary view strongly predicts that social perception should favour adaptive responses. In this talk I will discuss examples from face perception of accurate social judgement and potentially adaptive choices. One key arena for adaptation lies in variation: in preferences, for example, our individual perception of who is attractive appears to be influenced by the condition of the body we inhabit, our partnership status, our reproductive status, and the environment we find ourselves. In all of these domains preference can be said to vary in ways that are to the benefit of the perceiver. Preferences can also be seen to be influenced by simple exposure and via social learning, mechanisms which are also proposed to be adaptive in adjusting behaviour to fit the current environment. Overall, these studies highlight sophisticated and flexible mechanisms for generating variation in face preferences, mechanisms that are sensitive to: Internal biological factors, environment, experience, and other people's opinions and choices. Understanding the relevant selection pressures on human social choices can reveal why certain cues are so important in faces and illuminate why people vary in their social perception.

About the speaker

Dr Anthony Little is a Reader in Psychology at the University of Bath in England. He became interested in face perception as an undergraduate student at Durham University, completed an MSc at the University of Stirling, and a PhD at the University of St Andrews. He has lectured at the University of Liverpool and the University of Stirling where he also held a Royal Society University Research Fellowship from 2005-2013 before moving to the University of Bath in 2016. Since he began publishing in 2001, Dr Little has authored 182 academic articles and 11 book chapters, including articles in the Proceedings of the National Academy of Sciences, Proceedings of the Royal Society B, and Psychological Science. His research focuses on how faces are perceived and processed, the information people extract from faces, and why certain faces are found attractive from an evolutionary perspective.

Chris Frith

Wellcome Trust Centre for Neuroimaging, University College London;
Institute of Philosophy, School of Advanced Studies, University of London

Action, Agency & Responsibility

About the talk

We have very little awareness of the details and causes of our actions. We are, however, vividly aware of being in control of our actions and this gives us a sense of responsibility. These feelings arise, first, from intentional binding which creates a perception of agency, linking an intentional action to its outcome and, second, from the counterfactual reasoning that we could have chosen some other action. These feelings of responsibility play a critical role in creating social cohesion since they allow people to be held to account for deliberate antisocial behaviour. Because we are unaware of how little we know about our actions we are happy to make up stories about the nature and causes of our behaviour. These stories often do not correspond with the underlying cognitive and neural processes, but they can be changed through instructions and through discussion with others. Our experience of responsibility for action emerges during our upbringing through exposure to our culture. This creates consensus about the causes of behaviour, but not necessarily accuracy.

About the speaker

Chris Frith is Emeritus Professor of Neuropsychology at the Wellcome Centre for Neuroimaging at University College London and Honorary Research Fellow at the Institute of Philosophy, London University. Since completing his PhD in 1969 he was funded by the Medical Research Council and the Wellcome Trust to study the relationship between the mind and the brain. He is a pioneer in the application of brain imaging to the study of mental processes. He has contributed more than 500 papers to scientific journals and is known especially for his work on agency, social cognition, and understanding the minds of people with mental disorders such as schizophrenia. For this work he was elected a Fellow of the Royal Society in 2000 and a Fellow of the British Academy in 2008. He was Niels Bohr Visiting Professor in the Interacting Minds project at Aarhus University in Denmark from 2007-11 and a Fellow of All Souls College Oxford from 2011-2013. He has been awarded honorary degrees by the University of Salzburg and the University of York. He has published several books, including The Cognitive Neuropsychology of Schizophrenia (Psychology Press, 1992, classic edition 2015) and Making up the Mind: How the Brain Creates our Mental World (Wiley-Blackwell 2007). In 2009 he was awarded the Strömgren medal for work on Schizophrenia, the European Latsis Prize (Jointly with U Frith) for work on 'Human mind, Human brain' and the International Prize from the Fyssen Foundation for work on Neuropsychology. In 2014 he was awarded the Jean Nicod Prize (jointly with Uta Frith) for philosophical oriented work in cognitive science.

Ron Chrisley

Centre for Cognitive Science (COGS), University of Sussex, UK

Computation and Consciousness

About the workshop

This workshop will start by reviewing what consciousness is, and some of the difficulties facing attempts to provide a scientific explanation of consciousness. Next, the role of computation in providing such accounts will be considered: Why might one think computation is well- or ill-suited to explain phenomenal experience? These general issues will be brought into focus by considering the special case of qualia. What are they, and why might one think that they could never be given a physicalist or computational account? Drawing on recent work with Aaron Sloman, I will argue that despite conventional wisdom, there is a middle way between dualistic qualia realism and physicalistic qualia eliminativism, a way that is best explored by making use of computational notions.

Rough agenda:

- Session 1: "The Consciousness Challenge"
- Discussion
- Session 2: "Computation: Promise and Problems"
- Discussion
- Session 3: "Wither Qualia?"
- Discussion

About the speaker

Ron Chrisley is Reader in Philosophy in the School of Engineering and Informatics at the University of Sussex. He received a Bachelors of Science in Symbolic Systems, with honours and distinction, from Stanford University in 1987. He was an AI research assistant at Stanford, NASA, and Xerox PARC, and investigated neural networks for speech recognition as a Fulbright Scholar at the Helsinki University of Technology and at ATR Laboratories in Japan. In 1997 he received a DPhil in Philosophy from the University of Oxford, and in 1992 he took up a lectureship in Philosophy in the School of Cognitive and Computing Sciences at the University of Sussex. From 2001-2003 he was Leverhulme Research Fellow in Artificial Intelligence at the School of Computer Science at the University of Birmingham. Since 2003 he has been the director of the Centre for Cognitive Science (COGS) at the University of Sussex, where he is also on the faculty of the Sackler Centre for Consciousness Science.

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Ron Chrisley

Centre for Cognitive Science (COGS), University of Sussex, UK

Robots, virtual reality and human consciousness: Using technology to depict the ineffable

About the talk

The content of our experiences transcend our ability to express them in words. For millennia, this has been a driving force behind creativity and expressive art. Recent technological advances in robotics and virtual reality mean that we can begin, perhaps drawing on techniques developed by artists through history, to attempt a systematic and rigorous characterisation of the contents of experience through extra-linguistic media, an activity which I call "synthetic phenomenology". I argue that the development of a sophisticated synthetic phenomenology will be necessary for a mature science of consciousness, and that even the relatively superficial investigation of neural correlates of consciousness cannot hope to be successful without it.

About the speaker

Ron Chrisley is Reader in Philosophy in the School of Engineering and Informatics at the University of Sussex. He received a Bachelors of Science in Symbolic Systems, with honours and distinction, from Stanford University in 1987. He was an AI research assistant at Stanford, NASA, and Xerox PARC, and investigated neural networks for speech recognition as a Fulbright Scholar at the Helsinki University of Technology and at ATR Laboratories in Japan. In 1997 he received a DPhil in Philosophy from the University of Oxford, and in 1992 he took up a lectureship in Philosophy in the School of Cognitive and Computing Sciences at the University of Sussex. From 2001-2003 he was Leverhulme Research Fellow in Artificial Intelligence at the School of Computer Science at the University of Birmingham. Since 2003 he has been the director of the Centre for Cognitive Science (COGS) at the University of Sussex, where he is also on the faculty of the Sackler Centre for Consciousness Science.

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Giorgia Silani

Department of Basic Psychological Research and Research Methods, University of Vienna

When affect sharing and self-other distinction fail: understanding empathy from a developmental and clinical perspective

About the talk

Empathy, the ability to understand and share the feelings of another person, a major component of what has been termed "social intelligence," is a crucial element for successful social interactions and wellbeing. In the past decades, social neuroscience has started to shed light on the neural mechanisms underlying empathic brain responses in the normal and pathological populations, by defining the neuronal networks behind the cognitive and affective processes related to this complex social emotion. In this talk I will give an overview of the state of the art on brain research on empathy, by focusing on two main questions: 1) What are the behavioral and neural mechanisms underlying normal empathic responses? 2) How developmental and clinical factors affect our ability to empathize with other people? In the attempt to start a challenging and productive discussion on the aforementioned topics I plan to present both neuroimaging and behavioral studies that have addressed those questions.

About the speaker

Giorgia graduated in clinical psychology at the University of Turin in 1998, and obtained her PhD in cognitive neuroscience at the University of Milano in 2006. Between 2004 and 2006 she worked at the Institute of Cognitive Neuroscience, London, under the supervision of Prof. Uta Frith. In 2007 she was appointed as a post doc at the Center for Social Neuroscience and Neuroeconomics, University of Zurich, under Prof. Tania Singer. In 2010 she moved to Italy to lead the 'Collective Emotions and Social Cognitive Neuroscience Lab', at SISSA Scuola Internazionale Superiore di Studi Avanzati, Trieste. Since 2014 she is employed at Department of Applied Psychology: Health, Development, Enhancement and Intervention, University of Vienna. Giorgia´s major research focus lies in the neurobiological basis of social cognition, emotions, and behaviours. Besides the focus on normal population, she investigates the effects of normal and abnormal development on social interactions and cognition.

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Mathias Pessiglione

Motivation, Brain & Behavior (MBB) lab, Institut du Cerveau de la Moelle (ICM), Hôpital de la Pitié-Salpêtrière, Paris, France

Dopamine and reward maximization: insights from pharmacological studies in humans

About the talk

Dopamine has been implicated in several aspects of behavioral control: notably motor, motivational and learning processes. In this talk, I will intend to specify a unified computational role for dopamine, based on the simple notion that it may adjust the weight of reward prospect (in motivation processes) or reward obtainment (in learning processes). Such computational role can account for the effects of dopaminergic replacement therapy in Parkinson's disease, observed during tasks that involve a trade-off between reward maximization and effort minimization. It can be further dissociated from the motor role of dopamine, which may consist in adjusting the rate of muscle contraction/relaxation, irrespective of the rewards at stake.

About the speaker

Mathias Pessiglione has conducted pioneering studies combining cognitive testing, functional neuroimaging and computational modeling, mosty at the Pitié-Salpêtrière hospital in Paris and at the Wellcome Trust Center in London. He is now the head of the "Motivation, Brain & Behavior" lab at the Brain & Spine Institute (ICM) in Paris. His research aims at understanding the determinants of behavior (why we do what we do), in both normal and pathological conditions.

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