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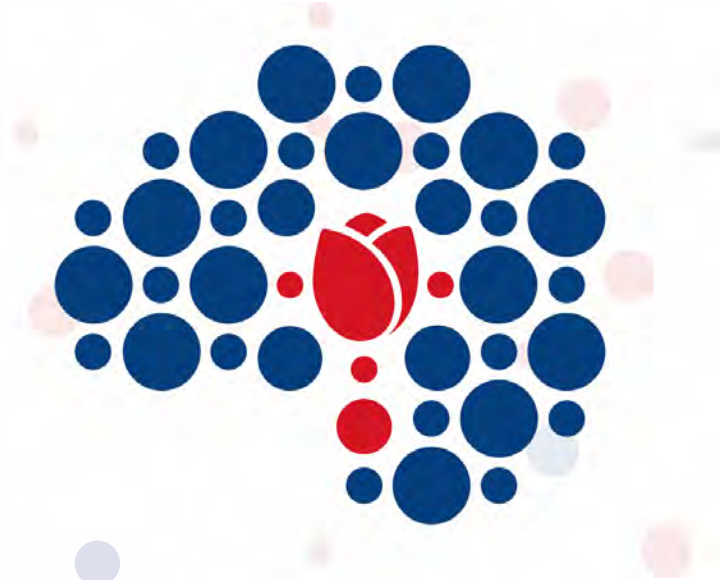
escan Leiden 2018

European Society for Cognitive and Affective Neuroscience

program 19-22 July



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ESCAN 2018 Schedule at a Glance

Thursday July 19th

Time	Activity	Location
8:30 - 15:30	Satellite workshops	LUMC & FSW
12:00-15:00	Conference Registration at LUMC	Main building, 1st floor
17:00-19:00	Welcome reception *	City Hall

* Conference Registration is possible at the welcome reception starting from 16:30

Friday July 20th

Time	Activity	Location
7:30	Conference Registration opens	Main building, 1st floor
8:30-9:30	Opening Remarks & Keynote Lecture: Lisa Feldman Barrett	CZ 6 (Burumazaal)
9:30-10:00	Coffee break	
10:00-12:00	Parallel Sessions	CZ 1-5
12:00-13:30	Lunch & Poster Session I	
13:30-14:50	Parallel Sessions	CZ 1-5
14:50-15:20	Coffee break	
15:20-17:00	Parallel Sessions	CZ 1-5
17:00-17:30	Coffee break	
17:30-18:40	Young researcher award lectures & Conference of the Future Award	CZ 6 (Burumazaal)
18:45-20:00	Conference of the Future: Rapid Research Jam	Foyer CZ6

Saturday July 21st

Time	Activity	Location
8:30-10:00	Parallel Sessions	CZ 1-5
10:10-10:40	Coffee break	
10:40-12:00	Parallel Sessions	CZ 1-5
12:00_13:30	Lunch & Poster Session II	
13:30_14:15	Keynote Lecture: Mara Mather	CZ 6 (Burumazaal)
14:30-15:50	Parallel Sessions	CZ 1-5
15:50-16:10	Coffee break	
16:10-17:50	Parallel Sessions	CZ 1-5
18:00-19:00	ESCAN general assembly	CZ 1
19:30-...	Conference dinner	Beachclub BAIT

Sunday 22 July 22nd

Time	Activity	Location
9:00-10:40	Parallel Sessions	CZ 1-5
10:40-11:10	Coffee break	
11:10:00-12:10	Parallel Sessions	CZ 1-5
12:10-13:15	Keynote Lecture: Elaine Fox (and Closing Remarks)	CZ 6 (Burumazaal)

COLOFON

Local organizing committee

Bernhard Hommel (Chair)
Guido Band
Lorenza Colzato
Mariska Kret
Roy de Kleijn
Roberta Sellaro
Zsuzsika Sjoerds
Henk van Steenbergen

Leiden University, Institute of Psychology
Cognitive Psychology Unit
Pieter de la Court Building
Wassenaarseweg 52
2333 AK Leiden
The Netherlands

Universiteit Leiden
Institute of Psychology

Design ESCAN 2018 logo

Vera Mekern

ESCAN board members

President:
Sonja Kotz
President-Elect, Deputy-Treasurer:
Bernhard Hommel
Treasurer:
Annekathrin Schacht
Secretary:
Lorenza Colzato

Frank Van Overwalle
Fernando Ferreira-Santos
Artur Marchewka
Manos Tsakiris

http://escaneurosci.eu/

Acknowledgments

The organizing committee would like to thank LUMC for providing the venue and support, and Leiden University and Leiden Institute of Brain and Cognition (LIBC) for supporting us. We thank the sponsors (see backside cover) for their support. We also like to thank the Leiden Convention Bureau (Leiden Marketing) for their help and materials. We are grateful for Sander Nieuwenhuis and his student support staff for their assistance during the conference.

Welcome to Leiden!

Koornbrug, Leiden
© M. Minderhout

CONTENTS

Turfmarkt, Leiden
© R. Liberato

Morspoort, Leiden
© E. Zachte

WELCOME ADDRESS ESCAN President

Welcome to ESCAN 2018, the 4th conference of the European Society for Cognitive and Affective Neuroscience in Leiden, the Netherlands. After three very successful meetings in Marseille, Dortmund, and Porto, we now look forward to an exceptionally well-organized and exciting meeting with fabulous highlights in the oldest (founded in 1575) and most charming university towns in the Netherlands. With three outstanding female keynote speakers, two female young research award winners, and participants from 37 countries world wide, we once again succeeded in promoting the mission of the Society to endorse and advance cognitive, affective, and social neuroscience as well as talent across all levels of scientific careers. We are delighted about the range of stimulating symposia (26), oral sessions (5), and poster sessions (2), all of which should foster fruitful discussion and collaboration for our members and participants. This of course reflects the brilliant work of our local organizing committee (Bernhard Hommel, Guido Band, Lorenza Colzato, Roy de Kleijn, Mariska Kret, Roberta Sellaro, Zsuzsika Sjoerds, and Henk van Steenbergen) and board members of ESCAN that we thank for all their efforts in preparation of this conference. In the name of the organizing committees and the ESCAN Board, we once again welcome you to ESCAN 2018 in Leiden. We hope it will be an exciting and stimulating meeting that you will remember.

Sonja Kotz, President

escan

WELCOME ADDRESS Chair Organizing Committee

The organizing team and I are very happy to welcome you in Leiden. We are proud to welcome no less than 377 (so far) registered participants from 34 nations, including Germany (62), the Netherlands (59), Great Britain (47), Italy (33), the USA (22), but also Mexico, Indonesia, Australia, Korea, and Taiwan. An excellent scientific program is waiting for you. You will see that there will be fewer posters than the last time in Porto but more parallel sessions, five in total. We are afraid that this makes some degree of thematic overlap unavoidable, but we did our best to keep this problem small. You will also see that social topics are particularly dominant this time, something we need to keep an eye on to make sure that the conference stays attractive for researchers in cognition and emotion as well. But cognitive and affective science is also strongly represented by the keynote speakers Lisa Feldman Barrett, Elaine Fox, and Mara Mather, whom we are very happy and very proud to have. The organizing team took pains to make the conference as efficient as possible, distances short, conference rooms comfortable, the food bearable, and the social event special, so we hope the only

variable we could not quite get a hold on remains the weather. It will be Dutch, which does translate into unpredictable. In any case, we are looking forward to meet you at the opening in our City Hall, at the beach, and of course at the conference.

Bernhard Hommel (chair)

and the organizing team from Leiden University:

Guido Band, Lorenza Colzato, Roy de Kleijn, Mariska Kret, Roberta Sellaro, Zsuzsika Sjoerds and Henk van Steenbergen

CONFERENCE INFORMATION

Conference venue

The 4th international conference of the European Society for Cognitive and Affective Neuroscience (ESCAN) takes place between 19-22 of July, 2018 at:

Leiden University Medical Center (LUMC)
Albinusdreef 2
2333 ZA Leiden
the Netherlands.

The LUMC is located right next to Leiden Central Railway Station.

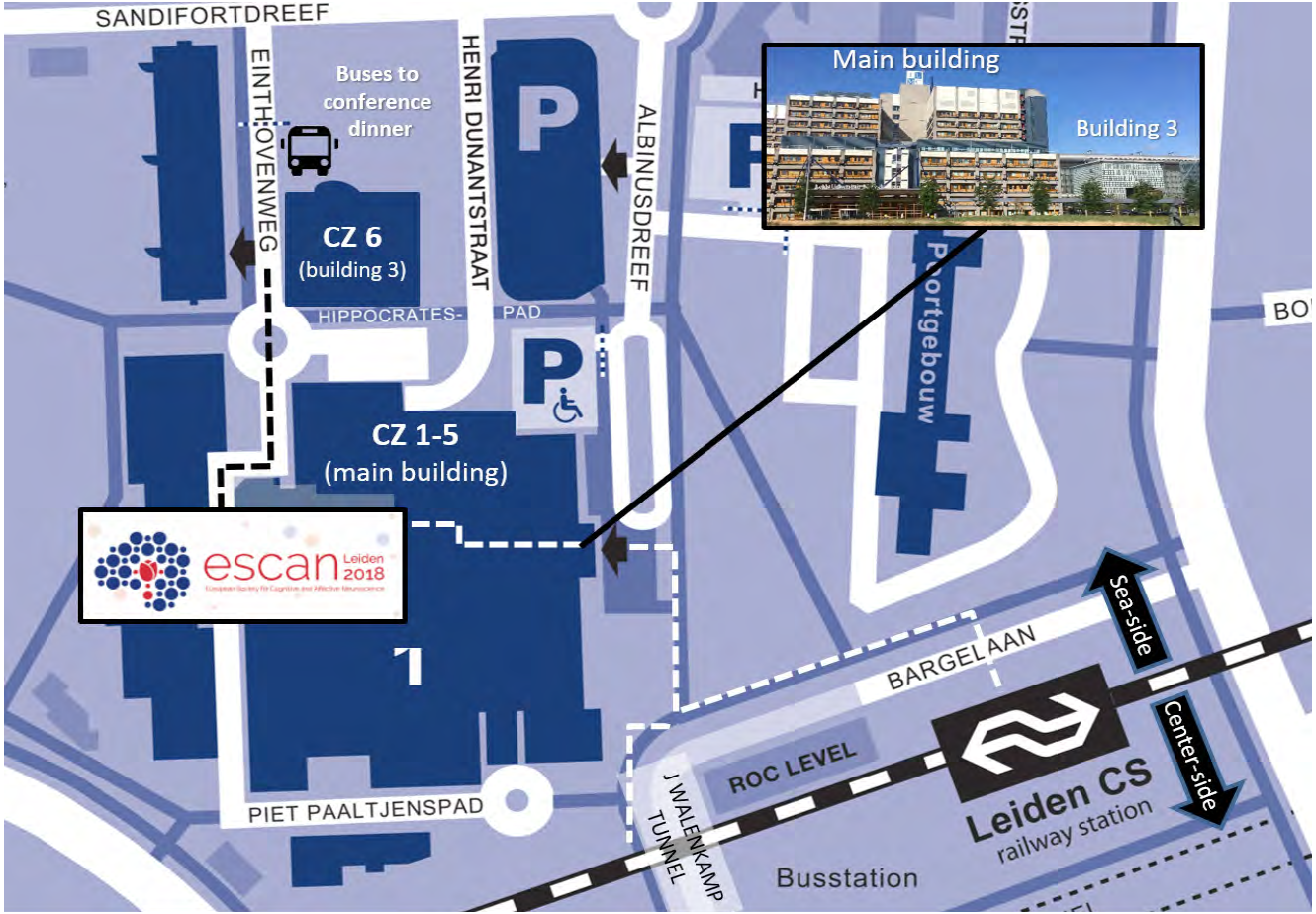
Lectures will take place in the main building (rooms CZ 1 through 5) and in building 3 (room CZ 6, also known as 'Burumazaal'), next to the main building - see map. As the registration desk is located next to rooms 1-5 in the main building, we advice you upon arrival to take the route through the main building past the registration desk, before you walk to room 6 in building 3.

If you arrive at the venue from the center-side of the train station, you can either take the passage at the Joop Walenkamptunnel, on the westside of the station, or walk through the station. For this last option, however, you need a ticket to check in- and out at the ticket gates. You will find a barcode in your conference bag, which you can use to pass through the station without having to get a ticket from the machine. Importantly: this barcode does not function as a train ticket. If you want to take the train, you still have to buy a ticket at the yellow ticket machines!

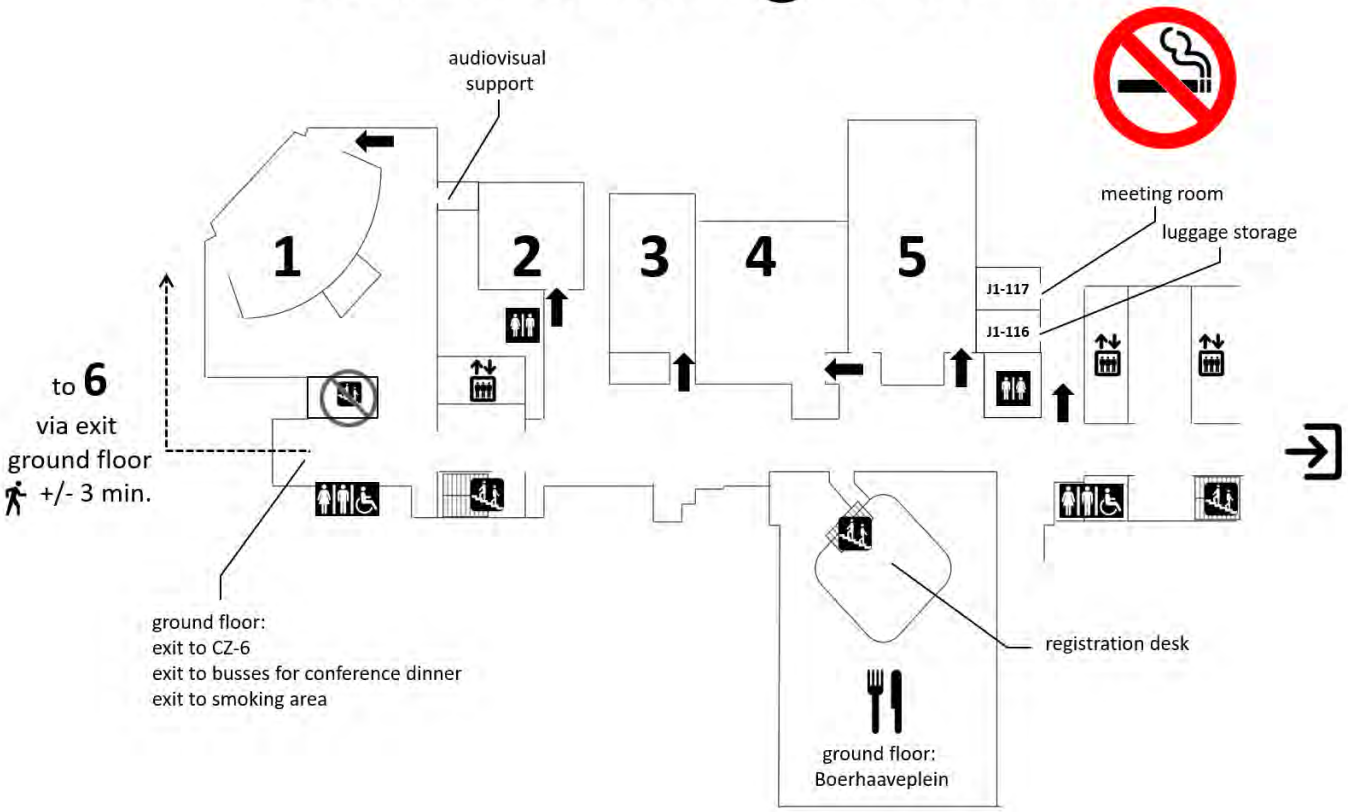
Accessibility

Hearing aids – Rooms 1 and 6 provide infrared audio transfer for people with compatible hearing aids. Users should check whether their apparatus is compatible.

Walking disabilities – Rooms 1-5 have easy interconnection on the same level, and are accessible by elevator. In case people want to use the direct isle between 1-5 and 6, they need to obtain assistance for the elevator.


SANDIFORTDREEF
EINTHOVENWEG
Buses to conference dinner
HENRI DUNANTSTRAAT
ALBINUSDREEF
Main building
Building 3
CZ 6
(building 3)
HIPPOCRATES-
PAD
CZ 1-5
(main building)
Portgebouw
escan Leiden 2018
1
Sea-side
BARGELAAN
ROC LEVEL
Leiden CS
railway station
Center-side
J WALENKAMP TUNNEL
Busstation
PIET PAALTJENSPAD

LUMC Building First Floor



Arrival

By plane

• Schiphol Airport; From here, you can take a train to Leiden Central Station, which will take about 15 minutes. A train from Schiphol to Leiden will leave about every 15 minutes. A single ticket (2nd class) will cost you €5,70 and can be bought at the airport upon arrival.

• Eindhoven Airport: From here, you have to take a bus to Eindhoven Central Station. This will take you about 20 minutes and will cost you around €5. From there, you can take a train to Leiden Central Station, which will take about 2 hours. A single ticket will cost you €19,70.

By train

• Information about train connections can be obtained on https://www.ns.nl/en/journeyplanner#/
• The LUMC is located within 5 minute walking distance from Leiden's Central Station (exit Zeezijde = sea side).

By bus

• All regional buses to Leiden stop at the Central Station in Leiden.
• Some buses stop in front of the LUMC, at Bargelaan (behind the station). All other buses stop at the bus station in front of the station (exit Centrumzijde = city center side).
• For up-to-date information on public transport you can call the Public Transport travel info line 0900-9292 (in Dutch, 75 cents per minute) or visit https://www.9292.nl/en.
• Please note that it is expensive (€2,70/h) to park a car in the city center of Leiden and that finding a free parking spot can be difficult. The city center is less accessible by car than you are used to. You may consider other modes of transportation after arrival, such as a rental bicycle.

By car

• Coming from Rotterdam (A13, A4): Take the A13 and then the A4 towards Amsterdam; exit at junction 6a (Zoeterwoude-Rijndijk, Leiden-Oost) and turn left. At the end of the road, turn right and follow the signposting ('H-Ziekenhuizen').

• Coming from Utrecht (A12, N11): Take the A12 and at Bodegraven take the exit for Leiden (N11). At the end of the N11, turn right and follow the signposting ('H-Ziekenhuizen').

• Coming from The Hague (N44, A44): From The Hague, take the N44 (which turns into the A44) and exit it at junction 8 (Leiden, Noordwijk, Katwijk); turn right and follow the signposting ('H-Ziekenhuizen').

• Coming from Amsterdam (A4, A44): Take the A4 and then the A44 in the direction of Leiden-West. Exit the A44 at junction 8 (Leiden, Noordwijk, Katwijk, N206), turn left and go under the viaduct. Follow the signposting ('H-Ziekenhuizen').

Parking is possible in multiple parking garages around the venue, including the parking garage at LUMC, closeby and at relatively low cost: https://www.lumc.nl/over-het-lumc/contact/parkeren/

At the conference

Registration

The registration desk is located in the LUMC at the 1st floor above the lunch area. You can also register for the conference at the welcome reception that will be held at the City Hall (Stadhuis, Burgerzaal. Stadhuisplein 1, Leiden). Please, bring an identification document with a picture to facilitate the registration process.
The registration desk at LUMC will be opened on Thursday 12:00-15:00, Friday 7:30-18:00, Saturday 8:30-18:00, and Sunday 8:00-13:00.

Conference name badges

Badges are issued at the conference registration desk and should be picked up upon arrival. Pre-registration for the conference is required. Attendees are kindly asked to wear the conference badge at all times during the conference. Your conference badge will be necessary for admission to all conference events, including lunch and (if ordered) conference dinner, the latter indicated by the blue line on your badge.

Certificate of attendance

Certficates of attendance can be requested at the registration desk.

Internet access

Wi-Fi will be available throughout the venue. This network is "LUMCgast" and there is no password – conference attendees will just need to open a browser and accept the terms of use in order to gain access. Access via eduroam is also possible.

Social Media

You can follow us on twitter: @ESCAN2018Leiden. We appreciate tweets about the conference. Use the hashtag: #ESCAN2018

Mobile App

The Conference4me smartphone app provides you with the most comfortable tool for planning your participation in ESCAN 2018. Browse the complete programme directly from your phone or tablet and create your very own agenda on the fly.
The app is available for Android, iOS and Windows Phone devices. To download the mobile app, please visit http://conference4me.eu/ to download, or type 'conference4me' in Google Play, iTunes App Store or Windows Phone Store. In the app you can find our conference named "European Society for Cognitive and Affective Neuroscience".

Coffee breaks

Coffee, tea, soft drinks, snacks, and other refreshments will be served during the official coffee break times and before the first morning session.

Lunch

The conference lunch will be served at the conference venue from 12:00 to 13:30 on each conference day. Lunch is included in the conference fee, so there are no lunch vouchers required. However, you are expected to carry your badge.

Diets

All diets that were reported during online conference registration have been passed through to the catering, and taken into account during food preparation. Please consult the catering staff.

Smoking

Due to the strict non-smoking policy regarding public buildings, smoking is strictly prohibited in all conference venues. There are some smoking areas in front of the main building.

Lactation Room

A lactation room is available upon request. Please inform at the registration desk.

Wardrobe

A luggage storage is available during the conference. Please ask the registration desk for directions. Wardrobes are available at the conference venue, but these are not guarded. We do not accept liability for your property.

Pharmacy/Emergency phone numbers

The general emergency phone number in The Netherlands is 112. The operator will guide you to the services that are most suited for the occasion. For non-urgent medical aid outside office hours, call +31252240212. There is a pharmacy at LUMC room C0-14 (phone +31715265400).

Taxi

If you need a taxi in Leiden, please call +31712100210.

Tourist Information

There are several tourist offices in Leiden. One of them is conveniently located directly at the center-side of Leiden Central Station: Stationsweg 26. We also provide tourist information booklets in the conference bag you get with registration. These contain most information you need for a great time in Leiden.

Restaurants

It is not hard to find a restaurant in the city center of Leiden, and there is a great variety of styles. Usually restaurants can cater to your dietary preferences. To compare and reserve restaurants, we suggest you visit https://www.thefork.com/restaurant+leiden.

Information for Talks & Posters

The official language of the meeting is English.

Open Science

We support open science, and therefore ask presenters (oral & poster) to upload their slides or poster to the special Open Science Framework platform we opened for this symposium: osf.io/view/ESCAN2018
Uploading instructions can be found on that website.

Symposia and Talk Sessions

Symposium and session chairs are asked to strictly keep to the schedule of the sessions to allow attendees to switch between sessions. Each talk is allocated a time slot of 20 minutes. We recommend that the presentations last about 15 minutes, followed by a 5-minutes discussion.

Oral presentations

PC computers for PowerPoint or PDF presentations are available in all lecture halls. Please refrain from using your own laptop to save time for the presentations and to avoid compatibility problems. Please make sure that your PowerPoint presentation is compatible with Microsoft PowerPoint 2016 for Windows. We kindly ask you to bring a flash drive / USB stick with your presentation file. ***Apple users are requested to bring their own adapters.*** Please hand your flash drive to our technical assistants at the lecture rooms at least 10 minutes before the start of your session.

Poster presentations

Posters should be printed in portrait orientation (DIN A0 size, equivalent to a maximum of 84 cm width x 119 cm height). Most poster boards are 1m wide and 2m high, so a bit larger than A0 will still fit. It is recommended to print the poster in a high resolution (at least 150 dots per inch, 4950 x 7050 pixels). For readability, it is best to divide the poster in two or more columns, to be read from left to right. Use fonts of 3.5cm high or more for title and 2cm high or more for name and 1cm high or more for affiliation. Use font 24pt for the text body. Posters should ideally contain small amounts of easy-to-access text and supportive illustrations.
The number of your poster indicates the board where you should hang it. The first digit of the poster number after "P" indicates the day of poster presentation (1: Friday, 2: Saturday).
Material to hang and mount the poster will be available. Mount your poster before the beginning of your poster session, and remove it right after the session. Please be

present with your poster during the session.

If you don't want to travel with a poster, you can consider printing it in Leiden. We have good experiences with MultiCopy, 300m from the conference venue. Price for an A0 full color poster (glossy or matte): € 21,50 Exc. VAT. Send a PDF two days in advance to leiden@multicopy.nl, or use WeTransfer for large files. For inquiries: +31713014715. Note that the shop is closed on Saturday.

Poster Award

There will be prizes awarded for the top three best posters during the ESCAN 2018 meeting. To be eligible for a prize, you must 1) be a student 2) present a poster during one of the poster sessions on Friday or Saturday, and 3) upload the pdf of your poster *before the beginning of the first poster session* to the Open Science Framework (OSF) platform we created for all presenters of ESCAN 2018: osf.io/view/ESCAN2018 (more info, see section 'Open Science' on the previous page). The poster prize winners will be announced during the closing session on Sunday.

Social Events

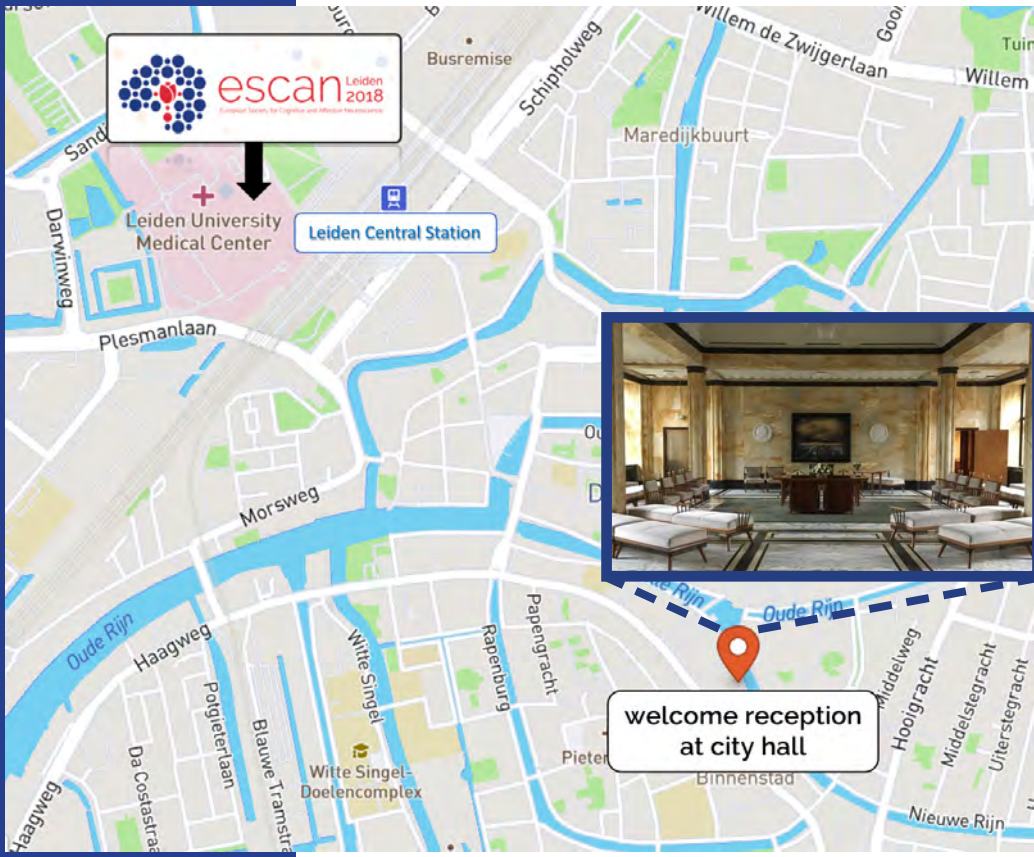
Welcome reception

The welcome reception will be held on Thursday July 19 from 17:00-19:00 at the City Hall ('Stadhuis' Burgerzaal, Stadhuisplein 1, Leiden)

Entrance: Monumental stairs, Breestraat (accross the book store on Breestraat 113).
Accesibility: People with walking disabilities can enter through the revolving door (Stadhuisplein 1), and take the elevator to the Burgerzaal

The price of the welcome reception is included in the conference registration fee.

Please note: *the welcome reception is limited to 200 places, so make sure you arrive on time.*



Conference dinner

The conference dinner will take place on Saturday July 21st from 19:30-24:00 at:

Beachclub BAIT
Wassenaarseslag 31
2242 PG Wassenaar

A BBQ at the beach will be served accompanied by drinks and wine. Tables are indoor. Two beach volleybal courts are available on the beach.

We will gather at the conference venue from where we will be transferred by bus to the conference dinner site. The first bus will leave at 18:30, the second one at 19:00 and the last one at 19:30.

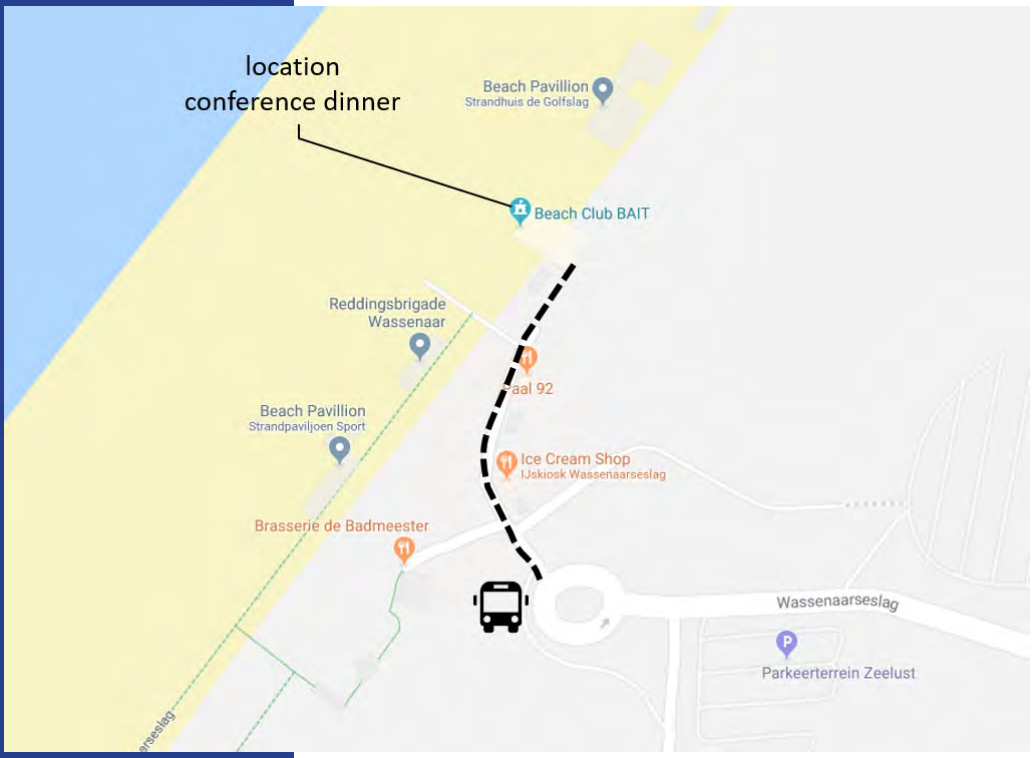
Buses from the Beachclub BAIT back to Leiden (LUMC) will leave every 30 min starting at 22:30. The last bus leaves at 23:30.
The conference dinner is not included in the registration fee and can be booked for an extra price of EUR 42,- (including bus transfer). If you would like to attend the conference dinner, please kindly select it in the registration form. Please do not forget to bring your badge, as this is needed to get access for the dinner.

Directions to Beach Club BAIT:
Aside from the buses we arranged to take us to the Beachclub, there is extremely limited public transport to that location. If you wish to come with your own transport:

From direction Amsterdam:
Direction The Hague (A4). At junction Burgerveen take the A44 towards Leiden-West. After 21 km turn right onto the Rozenweg. After 90 m take the third exit on the roundabout (Deijlerweg). After 2.8 km take the second exit on the roundabout (the Wassenaarseslag). This road ends at the parking lot and you can walk on the beach. Beachclub BAIT is in second place.

CONFERENCE INFORMATION

From Rotterdam / Utrecht / The Hague:
Go in the direction of The Hague (A13 from Rotterdam, A12 from Utrecht). At the Prins Clausplein junction, follow the A12 towards The Hague. After 6.4 km turn right onto Benoordenhoutseweg (N44) towards Scheveningen / Wassenaar. After 8.1 km, turn left onto the Lange Kerkdam. After 0.6 km take the first exit on the roundabout (Van Oldenbarneveltweg). After 200 m, turn left onto the Van Zuylen van Nyeveltstraat. After 1.7 km take the second exit on the roundabout (the Wassenaarseslag). This road ends at the parking lot and you can walk on the beach. Beachclub BAIT is in second place.



SCIENTIFIC PROGRAM

KEYNOTE LECTURES

KEYNOTE LECTURE I

Friday July 20th
8:45–9:30

Room:
Lecture Hall 6
("Burumazaal")
N.B.: please pass the registration desk in the main building first, if you did not pick up your badge yet

"From essences to predictions: A brain-based Understanding of emotion"

LISA FELDMAN BARRETT
Northeastern University

This talk will outline a computational architecture for the brain's use of prediction and prediction error signals to construct experiences and perceptions of emotion. Theory and research will be organized around two themes: (1) the shift from taxonomic thinking (the belief that an emotion has a particular facial expression and autonomic fingerprint) to population thinking (evidence that emotion categories consist of unique instances that are tailored to the specifics of the immediate situation); (2) the shift from essentialism (the belief that all instances of an emotion category share an underlying neural circuit) to degeneracy (evidence that instances of an emotion category are constructed as different configurations within the brain's functional architecture of interacting core networks). Furthermore, this approach suggests that allostasis, interoception, concepts and categorization represent key processes in the construction of all mental events, including emotions. These themes represent a shift in the scientific paradigm for measuring and understanding the nature of emotion and represents a framework for a unified science of the mind and brain.

Biographical sketch:
Lisa Feldman Barrett studied Psychology at University of Toronto. She then moved University of Waterloo where she obtained her PhD degree in Clinical Psychology. Since 2003 she is Professor of Psychology at Boston College. Her research addresses that question from both psychological and neuroscience perspectives, ultimately working toward a general framework for understanding how the brain creates the mind.

KEYNOTE LECTURE II

Saturday July 21st
13:30–14:15

Room:
Lecture Hall 6
("Burumazaal")

"How arousal increases neural gain and attentional selectivity"

MARA MATHER
University of Southern California

Moments of high arousal focus attention on and enhance memory for what matters most at the cost of lower priority information. It makes sense that arousal should make the brain more selective, as during high stakes moments it is important to devote resources to what has high priority and not be distracted by potentially irrelevant information. Much research indicates that noradrenaline released by the locus coeruleus is critical for increasing attention and memory selectivity during arousal. However, how can a neurotransmitter that is mainly released into the extrasynaptic space rather than at targeted synapses have such targeted effects? And how does the cortex signal which information should be enhanced versus suppressed under arousal? This signaling of priority needs to be a highly flexible process, as an external stimulus represented by a particular neuronal ensemble may have high priority in one context but low priority in another context and priority can shift quickly from moment to moment. Our Glutamate Amplifies Noradrenergic Effects (GANE) model posits that local glutamate levels influence local norepinephrine release, allowing for differential modulation based on salience. This allows local cortical levels of excitation to control local effects of locus coeruleus activity. As predicted by this model, in younger adults, locus coeruleus fMRI functional connectivity with the parahippocampal place area was maximized when arousal was high and a highly salient place image was visible. Older adults showed intact enhancement of highly salient stimuli processing under arousal but impaired suppression of non-salient stimuli. Comparing the two age groups' brain activation patterns suggests that, under arousal, the locus coeruleus stimulates the frontoparietal attention network to help suppress low priority information. In a subsequent study, we found that a simple manipulation of tonic LC-norepinephrine (NE) activity by using a handgrip task can rescue some of the age-related declines in frontoparietal network activity. Together, these mechanisms explain how mental focus narrows and sharpens when people are in high arousal situations, and how the locus coeruleus flexibly and rapidly identifies what mental processing to enhance under arousal and what to suppress.

KEYNOTE LECTURE II

MARA MATHER <continued>

Biographical Sketch:
Mara Mather studied Psychology at Stanford University. She then moved Princeton University where she obtained her PhD degree in Cognitive Psychology. Since 2011 she is Professor of Gerontology and Psychology at University of Southern California. Her work focuses on the theory that arousal enhances high-priority neural representations but suppresses low-priority neural representations of stimuli.

KEYNOTE LECTURE III

Sunday July 22nd
12:10–13:00
Room:
Lecture Hall 6
("Burumazaal")

"The Contribution of Cognitive Biases and Genes to Psychological Wellbeing"

Elaine Fox
Oxford University

A growing body of scientific evidence is uncovering the potential biological and psychological mechanisms that underlie differential sensitivity to the environment. Differential sensitivity refers to the notion that people differ in their emotional reactivity to both adverse as well as to positive and highly supportive environments. A relatively neglected factor in this research has been the role of systematic biases in cognitive processing that are known to be influential in determining differential sensitivity to environmental events. The CogBIAS project is investigating both cognitive and genetic markers of psychological wellbeing in adolescent and adult populations. Drawing on longitudinal as well as experimental studies, we are examining the role of multiple cognitive biases, and polygenic sensitivity scores (PSS), in establishing a spectrum of cumulative 'risk' or 'enhancement' that might tip the developmental trajectory towards vulnerability or resilience.

Biographical sketch:
Elaine Fox studied Psychology at University College Dublin. She is currently Research Professor in the Department of Experimental Psychology, University of Oxford and Director of the Oxford Centre for Emotions & Affective Neuroscience. Her work focuses on the nature of human emotions and why there is such a wide variety of response to the same environmental situation.

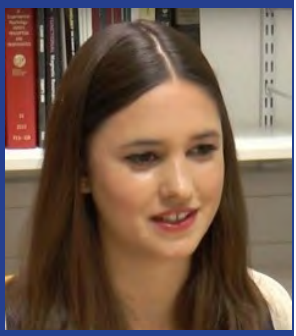
ESCAN young researcher award lectures

Friday July 20th
17:30–18:40

Room:
Lecture Hall 6
("Burumazaal")

"Neural basis of empathy and prosocial behaviour"

PATRICIA
LOCKWOOD
Oxford University



The question of whether humans are fundamentally selfish or prosocial has intrigued many disciplines from philosophy to economics for centuries. From small acts of kindness to major sacrifices, just how willing are humans to help others? Here I will describe how social computations are reflected in anatomically distinct portions of the medial prefrontal cortex, and the individual differences that may drive variability between people. I will show that in general, people care more about their own outcomes than others, but that there are substantial individual differences that are linked to specific brain areas. These findings could have important implications for understanding everyday social decision-making and its disruption in disorders of social behaviour such as psychopathy.

Biographical Sketch:
Patricia Lockwood studied psychology and philosophy at the University of Bristol before completing her PhD at University College London. She is now a Junior Research Fellow at Christ Church College, Oxford, and Medical Research Council Fellow at the University of Oxford and University of Zurich. Her work focuses on social learning and decision-making, and how these processes are related to individual differences in health, disease and ageing.

Mental health problems are placing a heavy and continuously growing burden on public health, calling for a resolution. Animal studies and a small number of human studies support the idea that the diverse microbial communities in the intestinal tract (i.e. the gut microbiota) are crucial in supporting optimal brain functioning; the bidirectional microbiota-gut-brain axis provides a paradigm shift with potential for promoting mental functioning. Research points at a number of physiological and cognitive processes involved. Focusing on transdiagnostic factors, I am evaluating the role of the gut microbiome and manipulations thereof in cognitive perseveration and the processing and recognition of emotions. Animal studies point at a potential key role of the vagal nerve (i.e. the direct link between the gut and the brain) in modulating the microbiota-gut-brain axis, but little direct evidence in humans is available. Correlational evidence from studies assessing heart rate variability, i.e. a reliable marker of activity of the vagal nerve, indeed confirm such a potential role. Using transcutaneous stimulation of the vagal nerve, furthermore confirms the key role of the vagal nerve in cognitive flexibility, considered to be the opposite of perseverance, and the processing and recognition of emotions. The next question, as such, is whether, and if so, how the vagal nerve connects (manipulations of) the gut microbiota to cognitive and emotional effects.

"Mind the microbes! Toward an understanding of the human microbiota-gut-brain axis"

LAURA STEENBERGEN
University of Amsterdam

Biographical Sketch:
Laura Steenbergen studied Psychology at Leiden University, where she also obtained her PhD degree in Cognitive Psychology in 2016. In 2017, she moved to the University of Amsterdam to further investigate the microbiota gut-brain axis, its mechanisms, and implications with regard to (cognitive) psychology. In 2018, she is visiting Ohio State University to study the involvement of the vagal nerve in microbiota-gut-brain interactions.

Conference of the future award

Friday July 20th
18:45–20:00

Room:
Lecture Hall 6
("Burumazaal")

Science communication is a dynamic process. Tomorrow's conference should be even more attractive than today's. Which format for scientific meetings would meet the demands of 21st century PhD students? The organizers of ESCAN Leiden 2018 have challenged PhD students to submit a format for an innovative science-related activity to take place during ESCAN Leiden 2018. We chose the best idea, which will be rewarded with a €300 travel grant, and will be adopted in this ESCAN meeting in Leiden.

The winning format is the
"Rapid Research Jam"
by Lilla Hodossy

An explanation of the winning format can be found here:
https://bit.ly/2Nr2Uvx

We invite young researchers (MSc & PhD students, Post Docs) to join this event. There will be drinks and bites served.

Thursday 19/07/2018	
8:30-15:30	Satellite workshops: see info below Registration for the ESCAN conference is possible from 12:00 - 15:00
17:00-19:00	Welcome Reception *Location: Stadhuis (Burgerzaal)* Registration for the ESCAN Conference is possible here starting from 16:00

The ESCAN Satellite on Cognitive Enhancement
July 19th 8:30-15:00 Leiden University Medical Center, Room CZ-4
Description: Cognitive enhancement is the use of any means aimed at enhancing performance in healthy individuals. The aim of the satellite meeting is to pursue a mechanistically oriented, theory-driven approach that tries to understand and explain how and why an intervention can enhance a targeted cognitive function. This provides an interesting bridge between the rigor and mechanistic interest of basic-science approaches and the opportunity to translate basic insights into programs with societal impact - an aspect that is increasingly emphasized by both funding agencies and individual researchers. Main topics of this satellite will be: cognitive training, psychedelics, brain stimulation, human-robot interaction and placebo effect.
Organizers: Lorenza S. Colzato, Alexandra Loseva & Luisa Prochazkova

Contextual: How the Social Context Shapes Brain and Behaviour
July 19th, 8:20-15:30 Faculty of Social Sciences, Leiden University, Room 1A01
Please visit the satellite web page (http://essan2018.lt-harris.info/) to register and for more information
Description: This pre-conference satellite features cognitive neuroscientists who will discuss how the social context influences brain and behavioural data across four themes: mimicry, social interaction, decision-making, and affect. This conference also serves as the third meeting of the European Society for Social and Affective Neuroscience (ESSAN, formerly ESAN), and provides an opportunity for social psychologists interested in the brain, and cognitive neuroscientists interested in social processes to meet and discuss their research
Organizers: Gert-Jan Lelieveld, Gayannée Kedia, Lasana T. Harris, Lotte van Dillen, Susanne Quadflieg

Introductory Workshop to Eye Tracking
July 19th, 14:45-16:45. Leiden University Medical Center, Room CZ-2
Description: Eye tracking is a technique that is used more and more to measure where we are looking and for how long. In the first part of the workshop we will give a brief introduction to eye tracking as a method, starting from the physiological basis of human attention and the vision system through the method basics and finishing at fields of application in psychological and interdisciplinary research. In the second part, participants will have the chance to join hands-on sessions to try out Tobii Pro's latest eye tracking solutions. This workshop is aimed at beginners and advanced eye tracking users, as well as interested parties.

Friday 20/07/2018

7:30	Registration opens				
8:30	Welcome address *Location: CZ-6 ("Burumazaal")*				
8:45	Keynote Lecture I: Lisa Feldman Barrett - From essences to predictions: A brain-based understanding of emotion *Location: CZ-6 ("Burumazaal")*				
9:30	Coffee Break *Location: Boerhaaveplein*				
10:00	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice *Location: CZ-1* Organizer(s): Alexander Soutschek	SYMPOSIUM - Heterogeneity in autism spectrum disorders *Location: CZ-2* Organizer(s): Giorgia Silani	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation *Location: CZ-3* Organizer(s): Sebastian Schindler	SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential *Location: CZ-4* Organizer(s): Lorenza Colzato & Bart Verkuil	SYMPOSIUM - Interactive brains: neural mechanisms of two-person social interaction *Location: CZ-5* Organizer(s): Antonia Hamilton
12:00	Lunch & Poster Session I *Location: Boerhaaveplein*				
13:30	SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control *Location: CZ-1* Organizer(s): Rocco Mennella & Julie Grèzes	SYMPOSIUM - Self-voice perception and its role in autism and auditory hallucinations *Location: CZ-2* Organizer(s): Laura Rachman & Jean-Julien *Aucouturier*	SYMPOSIUM - Recent developments in the neuropsychology of flavor processing *Location: CZ-3* Organizer(s): Lotte F. van Dillen	The self *Location: CZ-4* Chair: Roman Liepelt	SYMPOSIUM - The social brain in context: How we (dis)engage with socio-political issues *Location: CZ-5* Organizer(s): Manos Tsakiris & Lou Safra

14:50	Coffee Break *Location: Boerhaaveplein*				
15:20	SYMPOSIUM - Affective influences on cognitive control: Psychological processes *Location: CZ-1* Organizer(s): Gilles Pourtois	Psychopathology *Location: CZ-2* Chair: Marit Ruitenberg	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions *Location: CZ-3* Organizer(s): Mathias Weymar & Florin Dolcos	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing *Location: CZ-4* Organizer(s): Markus Rütgen & Federica Riva	SYMPOSIUM - The social neuroscience of human attachment *Location: CZ-5* Organizer(s): Pascal Vrticka
17:00	Coffee Break *Location: Boerhaaveplein*				
17:30	ESCAN young researcher award lectures *Location: CZ-6 ("Burumazaal")* Laura Steenbergen & Patricia Lockwood				
18:45-20:00	Conference of the Future Award: Rapid Research Jam *Location: Foyer*				

PARALLEL SESSIONS

SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice
Time: Friday, 20/Jul/2018: 10:00am - 12:00pm · Location: CZ-1

10:00am - 10:20am
Framing effect in social discounting
M. Sellitto, A. Schweda, T. Kalenscher

10:20am - 10:40am
Causal role of temporo-parietal junction for future-orientation in self-control: a TMS-fMRI study
A. Soutschek, M. Moisa, C. Ruff, P. Tobler

10:40am - 11:00am
Dopamine and proximity effects in cognitive control
A. Westbrook

11:00am - 11:20am
Are emotion regulation processes and skills related to dietary self-control?
S. U. Maier, T. A. Hare

11:20am - 11:40am
Unhealthy yet avoidable - How cognitive bias modification alters behavioral and brain responses to food cues in obesity
N. Mehl, F. Morys, A. Villringer, A. Horstmann

11:40am - 12:00pm
Extra presentation - it is not part of this symposium, but on a closely related topic.
How health goal priming promotes healthy food choice: a virtual reality fMRI study
N. van der laan, E. Papies, A. Ly, P. Smeets

SYMPOSIUM - Heterogeneity in autism spectrum disorders
Time: Friday, 20/Jul/2018: 10:00am - 12:00pm · Location: CZ-2

10:00am - 10:20am
Plasticity of space around the body: functional dissociation between social and action space in ASD children
F. Frassinetti, G. di Pellegrino, V. Giuberti, S. Erica, M. Candini

10:20am - 10:40am
Effect of cooperative and non-cooperative social interactions on personal space regulation in adults with autism spectrum disorders: an fMRI study.
C. Massaccesi, A. Grössing, M. Hubinger, L. Rosenberger, H. Hartmann, G. di Pellegrino, M. Candini, F. Frassinetti, G. Silani

10:40am - 11:00am
The contribution of alexithymia to social cognition in autism.
G. Bird

11:00am - 11:20am
A functional imaging investigation of social brain development in the Longitudinal European Autism Project (LEAP) cohort
C. Moessnang, U. Braun, S. Baumeister, V. Frouin, S. Baron-Cohen, S. Durston, A. Persico, W. Spooren, D. Murphy, E. Loth, J. Buitelaar, T. Banaschewski, D. Brandeis, H. Tost, A. Meyer-Lindenberg

11:20am - 11:40am
Investigating the factors underlying discrepancies in IQ and adaptive functioning in ASD in the EU-AIMS Longitudinal European Autism Project (EU-AIMS LEAP)
J. Tillmann, E. Loth, T. Charman

11:40am - 12:00pm
Extra presentation - it is not part of this symposium, but on a closely related topic.
Neuroimaging evidence for different facets, dimensions, and types of alexithymia
K. S. Goerlich

SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation
Time: Friday, 20/Jul/2018: 10:00am - 12:00pm · Location: CZ-3

10:00am - 10:20am
Beating the suspense!!! Heart rate variability as a predictor of rejection sensitivity?
M. J. van der Molen, E. Kortink, B. Verkuil, L. Colzato, W. Weeda

10:20am - 10:40am
"I remember that" - Social context amplifies ERP responses and simultaneously enhances and biases memory performance
J. Kissler, S. Schindler

10:40am - 11:00am
Preferential processing of anxiety sweat associated faces: Magnetoencephalographic correlates
I. Klinkenberg, C. Steinberg, M. Rehbein, I. Wessing, P. Zwitserlood, M. Junghöfer

11:00am - 11:20am
Chocolate incentives – Reward preferences in active and observational feedback processing
J. Peterburs, C. Bellebaum

11:20am - 11:40am
Neural and behavioral correlates of reward reversal learning: Decision making under threat
F. Bublatzky, S. Schellhaas, G. Koppe, C. Schmahl, C. Paret

11:40am - 12:00pm
Extra presentation - it is not part of this symposium, but on a closely related topic.
Maternal oxytocin responsiveness promotes positive social memory recall
W. S. Tse, A. F. Y. Siu, Q. Zhang, E. H. Chan

SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential
Time: Friday, 20/Jul/2018: 10:00am - 12:00pm · Location: CZ-4

10:00am - 10:20am
Transcutaneous vagus nerve stimulation (tVNS) enhances recognition of emotions in moving but not static bodies
L. S. Colzato, M. J. Maraver, P. Ricciardelli, R. Actis-Grosso, L. Steenbergen

10:20am - 10:40am
Transcutaneous vagus nerve stimulation (tVNS) enhances conflict-triggered adjustment of cognitive control
R. Fischer, C. Ventura-Bort, A. Hamm, M. Weymar

10:40am - 11:00am
Transcutaneous vagus nerve stimulation reduces spontaneous but not induced negative thought intrusions in chronic worriers
B. Verkuil, W. van der Does, J. F. Thayer, J. F. Brosschot, A. M. Burger

11:00am - 11:20am
Effects of transcutaneous vagus nerve stimulation (tVNS) on selective attention and long-term memory for emotional scenes: Behavioral and neural correlates
M. Weymar, C. Ventura-Bort, J. Wirkner, J. Wendt, A. Hamm

11:20am - 11:40am
The effects of transcutaneous vagus nerve stimulation on conditioned fear extinction in humans
A. M. Burger, I. Van Diest, J. Brosschot, W. van der Does, B. Verkuil

11:40am - 12:00pm
Extra presentation - it is not part of this symposium, but on a closely related topic.
Feeling in control – The affective function of autonomic processing
L. Hodossy, M. Tsakiris

SYMPOSIUM - Interactive brains: neural mechanisms of two-person social interaction
Time: Friday, 20/Jul/2018: 10:00am - 12:00pm · Location: CZ-5

10:00am - 10:20am
Neural mechanisms of imitation as a social signal
A. Hamilton, A. Georgescu, S. Krishnan-Barman, P. Pinti

10:20am - 10:40am
Interpersonal asymmetries: manipulating and decoding leader-follower roles from single and two-brain data
I. Konvalinka

10:40am - 11:00am
Neural basis of human-avatar motor interactions embedded in different social contexts
V. Era, S. Boukarras, M. Candidi

11:00am - 11:20am
Selective facial mimicry of in-group members in infancy and toddlerhood
C. de Klerk, C. Bulgarelli, A. Hamilton, V. Southgate

Extra presentation - it is not part of this symposium, but on a closely related topic.
The role of affective dimensions and face typicality in emotional face processing: An ERP study
M. R. Pereira, T. O. Paiva, F. Ferreira-Santos

POSTER SESSION I

Time: Friday, 20/Jul/2018: 12:00pm - 1:30pm
Location: Boerhaaveplein

P1-01 A comparison of effects of pharmacological and neurofeedback interventions for ADHD on behavioural and neurophysiological inhibitory control parameters
A. Bluschke, V. Roessner, C. Beste

P1-02 Favored unpleasantness perception in depressed patients: A multilevel study
L. De Zorzi, J. Honoré, M.-S. Robin, H. Sequeira

P1-03 Neural network changes in post-traumatic stress disorder: From diffusion tensor imaging to graph analysis
S. J. Siehl, M. Wicking, S. Pohlack, T. Winkelmann, F. Zidda, F. Steiger-White, J. King, N. Burgess, F. Nees, H. Flor

P1-04 The link between self-assessed emotional and intelectual states levels and real performance in cognitive tasks among patients with depression.
A. Kroll, E. Dańczura

P1-05 The impact of genetic versus environmental factors on human neurocognition and affect, and neurobehaviors from twin study in Human Connectome Project (HCP)
S. Eom, B. Joo, Y. Lee, B. Park

P1-06 Feasibility of visual-motor training in pediatric brain tumor survivors
A. Dreneva, A. Ryabova, V. Kasatkin

P1-07 Anxiety and neurodegenerative loss of amygdala inhibition in patients with mild cognitive impairment
Y. Blake, D. Terburg, E. Walsh, A. Donati, A. Von Gunten, J. van Honk, R. Stoop

P1-08 Memory, sleep, and the relationship between sleep disorders and memory impairment
P. Pedic

P1-09 A brief mindfulness-based intervention enhances psychological measures of wellbeing
G. L. de Lima Araujo, T. M. Almeida Silveira Mendes, M. M. Piva Demarzo, N. Farb, M. B. Cordeiro de Sousa

P1-10 Exploring individual differences in everyday pro-environmental behaviour - A neural trait approach
B. P. Langenbach, T. Baumgartner, L. Gianotti, D. Knoch

P1-11 Keep track: Age-related differences in pro-active driving behavior revealed by EEG measures
S. Getzmann, S. Arnau, M. Karthaus, E. Wascher

P1-12 Acquisition of orthographic representations in deaf readers
V. Varga, V. Csépe

P1-13 Effectiveness of TGFU in students' physical education performance through promoting metacognitive knowledge and metacognitive regulation
G. Stephanou, D. Karamountzos

P1-14 Morning brain: Evidence from EEG and learning outcomes that high school class times matter
S. Dikker, S. Haegens, D. Bevilacqua, L. Wan, I. Davidesco, T. West, M. Ding, D. Poeppel

P1-15 The relationships between measures of cognitive functioning among primary school age children with and without intellectual disabilities
T. Tikhomirova, I. Ayrapetyan, A. Malykh

P1-16 Subsequent memory effect associated with semantic encoding in mild cognitive impairment: An ERP study
M. C. Kuo, K. P. Liu, K.-h. Ting, L.-w. Chu, C. C. Chan

P1-17 Evidence for a neural dual-process account for adverse effects of cognitive control
N. Zink, A.-K. Stock, L. Colzato, C. Beste

P1-18 How non-veridical sensory dimensions shape action
M. L. Schreiter, W. Chmielewski, J. Ward, C. Beste

P1-19 Specific properties of the SI and

SII somatosensory areas and their effects on motor control: a system neurophysiological study
J. Friedrich, M. Mückschel, C. Beste

P1-20 Alcohol intake impairs intentional but not stimulus-driven inhibition
Y. Liu, W. P. van den Wildenberg, R. W. Wiers, K. R. Ridderinkhof

P1-21 Does gaze direction modify the age-related differences in Simon-effect?
Z. A. Gaál, B. Nagy, D. File, I. Czigler

P1-22 Control yourself: testing the relationship between cognitive control and prosociality
A. Farina, M. Giffin, J. Gross, C. De Dreu

P1-23 Exploring the effect of microdosing psychedelics on creativity
L. Prochazkova, D. Lippelt, L. Colzato, Z. Sjoerds, B. Hommel

P1-24 Methamphetamine-induced difficulties in cognitive control allocation may normalize after prolonged abstinence
A.-K. Stock, M. Rädle, C. Beste

P1-25 Motivation, but not training setting, impacts training-induced improvements in executive control in healthy older adults
M. J. Maraver, C. J. Gómez-Ariza, L. Trujillo, E. Borella, M. T. Bajo

P1-26 The effect of dual-task priming on convergent and divergent thinking
S. Heijnen, R. Sellaro, B. Hommel

P1-27 MPH reduces response conflicts only in case of high task automatization
W. Bensmann, C. Beste, A.-K. Stock

P1-28 Paradoxical, causal effects of sensory gain modulation on motor inhibitory control – A tDCS, EEG-source localization study
J. Friedrich, C. Beste

P1-29 The flexible modulation of theta oscillations and response inhibition performance
M. Mückschel, A. Bluschke, L. Summerer, C. Pscherer, C. Beste

P1-30 The Spatial-Numerical Association of Response Codes (SNARC) effect in task switching
V. A. Petruo, M. Mückschel, N. Wolff, C. Beste

P1-31 Within-modality specific modulations of response inhibition processes by the norepinephrine system
M. Mückschel, B. Bodmer, C. Beste

P1-32 Divergent thinking with and without emotional context: Are specific executive control processes important for the task at hand?
C. Rominger, I. Papousek, E. M. Weiss, G. Schulter, C. M. Perchtold, H. K. Lackner, A. Fink

P1-33 Emotional well-being predicts changes in executive functions during adolescence, not the other way around
G. Donati, E. Meaburn, I. Dumontheil

P1-34 Neural engagement with anti-drinking psas predicts real-world susceptibility of drinking behavior to conversational influence
C. Scholz, B. Doré, N. Cooper, E. Falk

P1-35 Breath of life: Does respiration affect autonomic balance and enhance cognition?
R. Gerritsen, B. van Voskuilen, G. Band

P1-36 Does goal congruence impact pupil dilation over and above goal relevance?
M. Kolnes, R. Naar, A. Uusberg

P1-37 Attentional biases to caloric food
F. Esteves, I. F. Santos, P. P. P. Machado

P1-38 Neuro-behavioral mechanisms of focused attention: immediate and long-term effects
S. Dolcos, Y. Katsumi, M. O'Brien, A. Iordan, A. Lleras, S. Buetti, F. Dolcos

P1-39 Does spontaneous eye blink rate predict attentional flexibility? It depends on task context
R. D. Calcott, E. T. Berkman

P1-40 It's behind my back - so it is dangerous! Psychophysiological responses

to sounds presented at the different spatial locations.
M. Olszanowski, J. Wlodek, N. Frankowska

P1-41 Political extremism increases attentional gating of expectancy violations
S. Reiss, J. Klackl, T. Proulx, E. Jonas

P1-42 Cognitive bias modification for facial interpretation: A randomised controlled trial of transfer to self-report and cognitive measures in a healthy sample
S. E. Peters, J. Lumsden, O. H. Peh, I. Penton-Voak, M. Munafò, O. Robinson

P1-43 Communication of positive emotions through odors conveyed by the human body
S. Richard Ortegon, A. Abriat, M. Bensafi, C. Ferdenzi Lemaitre

P1-44 Effects of emotional congruency and basic emotions on memory for emotional words within communicative context.
M. Riegel, M. Wypych, M. Wierzba, M. Szczepanik, K. Jednoróg, P. Vuilleumier, A. Marchewka

P1-45 Identifying emotions with EEG
E. Eijlers, M. Boksem, A. Smidts

P1-46 Neural correlates of embodied language: An fMRI study investigating neural activity during the evaluation of emotional and body-related words
C. Wiebking, C. Ralph-Nearman, C. Herbert

P1-47 RAMAS: The Russian Acted Multimodal Affective Set for affective computing and emotion recognition studies
O. Perepelkina, E. Kazimirova, M. Konstantinova, G. Sterling

P1-48 Synchronized psychophysiological and brain responses across healthy individuals during emotional movie watching
X. Li, P. Astikainen

P1-49 The impact of moral judgments on emotional face perception: Electrophysiological evidence
R. K. Demel, A. Schacht

P1-50 The role of facial mimicry in emotion recognition
A. Moccia, G. Mangiaracina, M. Ponari

P1-51 - *Withdrawn* -

P1-52 Cognitive Biases and Adolescent Worry
A. Songco, E. Fox

P1-53 Stress modulates the impact of emotional cues on action-related decision
M. Beaurenaut, E. Vilarem, R. Mennella, G. Dezecache, J. Grèzes

P1-54 The underlying mechanisms of sexual attraction: real-life dating experiment
E. Prochazkova, M. Kret

P1-55 The impact of disgust sensitivity and gender on moral judgments beyond transgression.
A. C. Ziereis, R. Demel, A. Schacht

P1-56 Myomagnetography: Localization of facial muscular contractions through magnetoencephalography
G. Barchiesi, G. Demarchi, F. Wilhelm, N. Weisz

P1-57 Comparison of neuronal and cognitive mechanisms of reappraisal sub-types
A. D. Tymorek

P1-58 Interaction of visually and auditorily derived affect - An MEG study
M. Tiihonen, S. Saarikallio, N. Trusbak Haumann, Y. Shtyrov, E. Brattico

P1-59 The relationship between callous-unemotional traits and neural processing of facial expressions in healthy young adults
E. Szabó, N. Kocsel, A. Édes, D. Pap, A. Galambos, T. Zsombók, Á. G. Szabó, L. R. Kozák, G. Bagdy, G. Juhász, G. Kökönyei

P1-60 The role of state changes of intrinsic functional connectivity in mood-congruency and emotion dynamics in daily-life: An ESM – fMRI study
J. Provenzano, P. V. Verduyn, P. Fossati, P. Kuppens

P1-61 Stimulus category modulates proactive interference related brain activity: An EEG study

H. Moore, A. Sampaio, D. Pinal

P1-62 Can you sync with me? the mechanisms underlying impaired synchrony in autism
I.-Z. Marton, H. Gvirts, S. Shamay-Tsoory

P1-63 Neural correlates of costly helping behavior in the general population and Mirror Touch Synesthesia.
K. Ioumpa, S. Gallo, C. Keysers, V. Gazzola

P1-64 Seeing it my way when there are too many other people
Z. Aslan, T. Eskenazi, G. Meert, N. Sebanz, D. Samson

P1-65 Visualizing human beings: image framing in photojournalism and the dehumanization of refugees
R. T Azevedo, S. De Beukelaer, M. Tsakiris

P1-66 The social side of pain. Self-related and moral contextual cues modulate pain perception during social interactions.
V. Nicolardi, M. D'Ippolito, G. L. Pecimo, M. S. Panasiti

P1-67 Motivation to confront prejudice predicts women's approach, challenge, and threat responses to sexism
B. J Casad, Z. W Petzel, M. M Siebert, A. M Manwarring, G. Piccinini

P1-68 Characterizing body image distortion and bodily self-plasticity in anorexia nervosa via immersive virtual reality
L. Provenzano, S. Ciccarone, G. Porciello, G. Tieri, M. Marucci, F. Dazzi, C. Loriedo, B. Lenggenhager, I. Bufalari

P1-69 Cognitive implications of objectification: Can women be literally perceived as objects?
C. Cogoni, J. Vaes, G. Cristoforetti, D. Ruzzante, V. Mazza

P1-70 How women consumers feel about thin and larger sized models, how models with different sizes affect buying behaviour, and can we make women consumers feel more positively about larger sized models by using different slogans?
E. Pinar, C. Tas

P1-71 Bodily sensations in social scenarios: Where in the body?
G. Novembre, M. Zanon, I. Morrison, E. Ambron

P1-72 The lost ability to distinguish between self and other voice following a brain lesion
M. Candini, S. Avanzi, A. Cantagallo, M. Zangoli, M. Benassi, P. Querzani, E. M. Lotti, T. Iachini, F. Frassinetti

PARALLEL SESSIONS

SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control
Time: Friday, 20/Jul/2018: 1:30pm - 2:50pm · Location: CZ-1

1:30pm - 1:50pm
Approach through a virtual looking-glass: Congruency relations between emotional stimuli and full-body movements in a 3D virtual world
A. B. Eder, A. Krishna, A. Sebald, W. Kunde

1:50pm - 2:10pm
Neurophysiological control of human defensive action
F. Klumpers, M. Hashemi, A. Hulsman, W. Zhang, R. Kaldewaij, B. Figner, S. Koch, K. Roelofs

2:10pm - 2:30pm
Action decision and inhibition under social threat
R. Mennella, E. Vilarem, J. Grèzes

2:30pm - 2:50pm
Emotion in Action: A predictive-processing theory approach to inferring action intentions
K. R. Ridderinkhof

SYMPOSIUM - Self-voice perception and its role in autism and auditory hallucinations
Time: Friday, 20/Jul/2018: 1:30pm - 2:50pm · Location: CZ-2

1:30pm - 1:50pm
Automatic processing of expressive changes on self-produced and other-produced speech
L. Rachman, S. Dubal, J.-J. Aucouturier

1:50pm - 2:10pm
When prediction errs: Voice-selective alterations in nonclinical voice hearers
A. Pinheiro, M. Schwartze, S. Kotz

2:10pm - 2:30pm
Self-face and self-voice recognition in Autism Spectrum conditions
A. Chakraborty, B. Chakrabarti

2:30pm - 2:50pm
Spontaneous decoding of ambiguous speech in individuals with non-clinical auditory hallucinations
C. Lima, B. Alderson-Day, S. Evans, S. Krishnan, P. Shanmugalingam, C. Fernyhough, S. K Scott

SYMPOSIUM - Recent developments in the neuropsychology of flavor processing
Time: Friday, 20/Jul/2018: 1:30pm - 2:50pm · Location: CZ-3

1:30pm - 1:50pm
The relative contribution of sweetness and calories to carbohydrate reward
M. G. Veldhuizen

1:50pm - 2:10pm
Opioid regulation of food motivation and hedonics in healthy humans
M. Eikemo, S. Leknes

2:10pm - 2:30pm
Alterations in neural flavor processing
S. Boesveldt

2:30pm - 2:50pm
Too busy to taste: the paradoxical effects of working memory load on neural responses to sweet taste
L. F. van Dillen, H. van Steenbergen

The self
Time: Friday, 20/Jul/2018: 1:30pm - 2:50pm · Location: CZ-4
Session Chair: Roman Liepelt
1:30pm - 1:50pm
Affective touch and the bodily self
M. Ambrosecchia, A. Germani, V. Gallese

1:50pm - 2:10pm
A matter of you versus me: How enhanced self-representation enables self-other distinction
R. Liepelt

2:10pm - 2:30pm
Me, myself, and…you: The neural mechanisms underlying non-social and social performance monitoring in healthy females scoring low or high on psychopathic traits
S. Overgaauw, M. Jansen, E. de Bruijn

2:30pm - 2:50pm
Dissociating perceptual biases for self and in-group processing

F. E. Enock, P. L. Lockwood, J. Sui, F. Emmerling, G. W. Humphreys, M. R. C. Hewstone

SYMPOSIUM - The social brain in context: How we (dis)engage with socio-political issues
Time: Friday, 20/Jul/2018: 1:30pm - 2:50pm · Location: CZ-5

1:30pm - 1:50pm
How do we choose our leaders?
L. Safra, N. Baumard, C. Chevallier

1:50pm - 2:10pm
Rethinking the function of dehumanisation in human atrocities
L. Harris, C. Guillard, C. Lillie, B. Knapp, R. Wilson

2:10pm - 2:30pm
How (not) to be dishonest: A discussion on corruption, morality, and pain
P. [. Mitkidis

2:30pm - 2:50pm
'Feeling in seeing' is believing: Visceral reactivity as a precursor to authenticity judgments of photojournalistic images
M. Tsakiris, S. De Beukelaer, R. Azevedo

SYMPOSIUM - Affective influences on cognitive control: Psychological processes
Time: Friday, 20/Jul/2018: 3:20pm - 5:00pm · Location: CZ-1

3:20pm - 3:40pm
Does emotional valence affect executive control?
S. A Kotz

3:40pm - 4:00pm
The affective nature of errors and its neurochemical modulation
H. van Steenbergen

4:00pm - 4:20pm
Alterations in performance monitoring as a transdiagnostic risk marker for psychopathology
A. Riesel, N. Kathmann

4:20pm - 4:40pm
Effects of goal's impact on error monitoring
G. Pourtois, M. C. Severo, W. Walentowska, A. Moors

4:40pm - 5:00pm
Extra presentation - it is not part of this symposium, but on a closely related topic. Effects of focused attention and open monitoring meditation on error-related processing - Behavioral and neurophysiological changes
K. Eichel, B. Cullen, W. Britton

Psychopathology
Time: Friday, 20/Jul/2018: 3:20pm - 5:00pm · Location: CZ-2
Session Chair: Marit Ruitenberg

3:20pm - 3:40pm
Non-motor problems in Parkinson's disease: Cognition and impulsivity
M. Ruitenberg, R. Seidler, W. Notebaert

3:40pm - 4:00pm
Allostatic load: A snapshot of stress in rural to urban migrant Chinese parents
J. P. Siegel

4:00pm - 4:20pm
Neural correlates of reward in relation to apathy in schizophrenia: Neuroimaging and implications for novel treatment approaches
A. Aleman

4:20pm - 4:40pm
The predictive role of mother, father and peer attachment in adolescents' depressive symptoms
A. Zia, S. Shahzad

4:40pm - 5:00pm
Altered hand movement behavior in athletes with a history of a sport-related concussion
I. Helmich, N. Simalla, O. Nele, J. Rebecca, R. Katharina, L. Hedda

SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
Time: Friday, 20/Jul/2018: 3:20pm - 5:00pm · Location: CZ-3

3:20pm - 3:40pm

How emotional arousal interacts with top-down goal in affecting memory
M. Sakaki, J. Raw, D. Clewett, T. Ueno, M. Mather

3:40pm - 4:00pm
Brain potentials during encoding and retrieval of emotional associates
M. Weymar, C. Ventura-Bort, J. Wendt, F. Dolcos, A. Hamm

4:00pm - 4:20pm
Disruptive effects of negative emotion on the coherence of episodic memories
J. Bisby, A. Horner, D. Bush, N. Burgess

4:20pm - 4:40pm
Retrieval-based memory bias modification for depression
J. N. Vrijsen, J. Dainer-Best, S. Witcraft, S. Papini, B. Müller, P. Hertel, C. Beevers, E. Becker, I. Tendolkar, J. Smits

4:40pm - 5:00pm
The impact of emotion on relational memory: behavioral, eye-tracking, and brain imaging evidence
F. Dolcos, M. O'Brien, Y. Katsumi, Y. Hu, C. Williams, A. Iordan, E. Denkova, H. Berenbaum, S. Dolcos

SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Time: Friday, 20/Jul/2018: 3:20pm - 5:00pm · Location: CZ-4

3:20pm - 3:40pm
Is mimicry socially modulated in autism?
P. Forbes, A. Hamilton

3:40pm - 4:00pm
The effect of sleep restriction on empathy for pain and emotional mimicry: An fMRI study in younger and older adults
S. Renberg Tamm, G. Nilsonne, J. Schwarz, C. Lamm, G. Kecklund, P. Petrovic, H. Fischer, T. Åkerstedt, M. Lekander

4:00pm - 4:20pm
The influence of age on emotional egocentrism
F. Riva, M. Tschernegg, M. Kronbichler, C. Lamm, G. Silani

4:20pm - 4:40pm
Disentangling the effects of major depression disorder and antidepressant treatment on empathy for pain
M. Rütgen, C. Pletti, M. Tik, C. Kraus, N. Geissberger, M. Klöbl, M. Woletz, T. Vanicek, C. Windischberger, R. Lanzenberger, C. Lamm

4:40pm - 5:00pm
Prosocial Apathy: When helping others is just too much effort
M. A J Apps, P. L Lockwood

SYMPOSIUM - The social neuroscience of human attachment
Time: Friday, 20/Jul/2018: 3:20pm - 5:00pm · Location: CZ-5

3:20pm - 3:40pm
Neural responses to infant and adult tears: The impact of maternal love withdrawal
M. Riem

3:40pm - 4:00pm
Neural correlates of listening to attachment-specific narratives
A. L. Leutritz, L. Colic, V. Borchardt, M. Li, T. Nolte, M. Walter

4:00pm - 4:20pm
How mothers brake their child's heart: Cardiac slowing upon peer-exclusion mediates effects of preschoolers' representations of mothers on school-age peer problems and depression
L. O. White, B. Bornemann, A. M. Klein, M. J. Crowley, K. von Klitzing

4:20pm - 4:40pm
The effects of attachment and caregiving on neural synchrony in mother-child interactions
Q. T. Nguyen, E. Kayhan, H. Schleihauf, D. Matthes, P. Vrticka, S. Hoehl

4:40pm - 5:00pm
The social neuroscience of human attachment: State of the art and future directions
P. Vrticka, M. Rohr, T. Ein-Dor, W. Verbeke, M. Mokry, J. Baker, N. Liu, X. Cui, M. Saggar, H. Hosseini, A. Reiss

Saturday 21/07/2018

8:30	Social cognition I *Location: CZ-1* Chair: Hans IJzerman	SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation *Location: CZ-2* Organizer(s): Sebastian Schindler & Maimu Rehbein	SYMPOSIUM - From social cognitive neuroscience to robotics and back – what can we learn from bidirectional links between these disciplines *Location: CZ-3* Organizer(s): Agnieszka Wykowska & Giorgio Metta	SYMPOSIUM - A failure to filter threat?: How bottom-up and top-down control processes contribute to the expression and regulation of fear and anxiety *Location: CZ-4* Organizer(s): Carien M. van Reekum & Matthias J. Wieser	Social attention *Location: CZ-5* Chair: Cesco Willemse
10:10	Coffee Break Location: Boerhaaveplein				
10:40	SYMPOSIUM - The Balance between You and Me: Integrating social, affective and embodied approaches to the self-other distinction *Location: CZ-1* Organizer(s): Aikaterini (Katerina) Fotopoulou, Louise P. Kirsch & Laura Crucianelli	Autism *Location: CZ-2* Chair: Eleanor Rose Palser	Social cognition II *Location: CZ-3* Chair: Georgia Stephanou	SYMPOSIUM - Predictive processing approaches in affective neuroscience *Location: CZ-4* Organizer(s): Fernando Ferreira-Santos	Attention *Location: CZ-5* Chair: Louisa Kulke
12:00	Lunch & Poster Session II *Location: Boerhaaveplein*				
13:30	Keynote Lecture II: Mara Mather - How arousal increases neural gain and attentional selectivity *Location: CZ-6 ("Burumazaal")*				

14:30	Cognitive control *Location: CZ-1* Chair: Bernhard Hommel	SYMPOSIUM - The Social Cerebellum: New insights and evidence *Location: CZ-2* Organizer(s): Frank Van Overwalle	SYMPOSIUM - Putting interoception at the heart of social cognition: Addressing method-ological, conceptual and research challenges *Location: CZ-3* Organizer(s): Manos Tsakiris	Face perception *Location: CZ-4* Chair: Mareike Bayer	Decision making *Location: CZ-5* Chair: Eliana Vassena
15:50	Coffee Break *Location: Boerhaaveplein* Sponsored by Springer				
16:10	SYMPOSIUM - Behav-ioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off *Location: CZ-1* Organizer(s): Zsuzsika Sjo-erds & Kerstin Fröber	SYMPOSIUM - How mo-tivational and learning processes shape pain and avoidance *Location: CZ-2* Organizer(s): Marta Andreat-ta & Marieke Jepma	SYMPOSIUM - Rein-forcement learning in a social world *Location: CZ-3* Organizer(s): Björn Lind-ström & Philip Pärnamets	Memory *Location: CZ-4* Chair: Conny Quaedflieg	Social decision making *Location: CZ-5* Chair: Michiel Marten Spape
18:00-19:00	ESCAN general assembly *Location: CZ-1*				
19:30	Conference Dinner *Location: Beachclub BAIT* - From LUMC to Beachclub BAIT: first bus leaves at 18:30, second bus at 19:00, last bus at 19:30 - From Beachclub BAIT to LUMC: first bus leaves at 22:30, second bus at 23:00, last bus at 23:30				

PARALLEL SESSIONS

Social cognition I

Time: Saturday, 21/Jul/2018: 8:30am - 10:10am · Location: CZ-1

8:30am - 8:50am
Social thermoregulation: A meta-analysis
H. IJzerman

8:50am - 9:10am
Body posture impact on action decisions under social threat
H. Metzler, E. Vilarem, A. Petschen, G. Julie

9:10am - 9:30am
Task-specific functional connectivity during the observation of social versus non-social touch.
H. Lee Masson, I. Pillet, H. Op de Beeck

9:30am - 9:50am
Effects of intranasal oxytocin and methylation of the oxytocin receptor gene on neural and behavioral correlates of caregiving and social sensitivity
P. Bos, H. Spencer, E. Montoya

9:50am - 10:10am
Jumping on the BADwagon: The effects of group membership on the decision to exclude others
G.-J. Lelieveld, L. Van Dillen, L. Harris

SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation

Time: Saturday, 21/Jul/2018: 8:30am - 10:10am · Location: CZ-2

8:30am - 8:50am
Generalization of conditioned fear in anxious adolescents
I. Wessing, K. Keuper, T. Straube, M. Junghöfer

8:50am - 9:10am
Affective face processing under conditions of predictable and unpredictable threat
I. Klinkenberg, A. L. Klahn, M. Rehbein, C. Steinberg, P. Zwanzger, P. Zwitserlood, M. Junghöfer

9:10am - 9:30am
Affective context modulates event-related responses towards faces and words – Comparing depressive patients with healthy controls
S. Schindler

9:30am - 9:50am
Abnormal approach-related motivation but spared reinforcement learning in MDD: Evidence from fronto-midline Theta oscillations and frontal Alpha asymmetry
D. Gheza, J. Bakic, C. Baeken, R. De Raedt, G. Pourtois

9:50am - 10:10am
Emotional picture processing and its modulation via tDCS in major depressive disorder
M. Rehbein, C. Winker, S. Notzon, V. Arolt, C. Wolters, M. Junghoefer

SYMPOSIUM - From social cognitive neuroscience to robotics and back – what can we learn from bidirectional links between these disciplines

Time: Saturday, 21/Jul/2018: 8:30am - 10:10am · Location: CZ-3

8:30am - 8:50am
Modeling cognitive mechanisms in an embodied system
K. Twomey

8:50am - 9:10am
Using embodied humanoid robots as means to study human social cognition
A. Wykowska

9:10am - 9:30am
Narrative structuring of experience for extended social interactions in humans and robots
P. F. Dominey

9:30am - 9:50am
Brain-like architectures in AI for embodied systems
G. Metta

9:50am - 10:10am
Designing robot-based games for individuals with autistic spectrum disorder
P. Chevalier

SYMPOSIUM - A failure to filter threat?: How bottom-up and top-down control processes contribute to the expression and regulation of fear and anxiety

Time: Saturday, 21/Jul/2018: 8:30am - 10:10am · Location: CZ-4

8:30am - 8:50am
Stimulus-evoked alpha power reduction in long-term conditioned fear
C. Panitz, A. Keil, E. M. Mueller

8:50am - 9:10am
Sensory processing and the anticipation of threat: Does threat modality, sensory modality, and type of anxiety matter?
M. J Wieser, P. Reicherts, G. Juravle, A. von Leupoldt

9:10am - 9:30am
Intolerance of uncertainty is associated with threat generalisation across psychophysiological and neural indices of aversive learning
J. Morriss, C. M van Reekum

9:30am - 9:50am
Plasticity of fear extinction networks and relations with cognitive control in trait anxiety
C. Larson, D. Stout, E. Belleau

9:50am - 10:10am
Attentional control as a determinant of anxiety related vulnerability and resilience
N. Derakhshan

Social attention

Time: Saturday, 21/Jul/2018: 8:30am - 10:10am · Location: CZ-5

8:30am - 8:50am
Mutual gaze in combination with cue reliability influence gaze cueing effect
K. Kompatsiari, F. Ciardo, J. Perez-Osorio, A. Wykowska

8:50am - 9:10am
Robots who follow the (gaze) leader: Studying joint attention with embodied agents and mobile eyetracking
C. Willemse, A. Wykowska

9:10am - 9:30am
A top-down driven attention reduction mechanism in dyads sharing the locus of attention? Insights from functional connectivity in a dual-EEG study
J. C. Avendano Diaz, X. He

9:30am - 9:50am
Social inhibition of return: Believe it or not
O. Nafcha, S. Gabay, S. Shamay-Tsoory

9:50am - 10:10am
Brain synchronization during first time social interaction
G. Kedia, S. Fresnoza, C. Hutzinger, E. Jauk, A. Ischebeck, K. Corcoran

SYMPOSIUM - The Balance between You and Me: Integrating social, affective and embodied approaches to the self-other distinction

Time: Saturday, 21/Jul/2018: 10:40am - 12:00pm · Location: CZ-1

10:40am - 11:00am
Comfortable in our own skin: From body boundaries to self-other distinction
L. Crucianelli, L. P. Kirsch

11:00am - 11:20am
Self-Other distinction in empathy is modulated by cTBS on right supramarginal gyrus and dispositional cognitive empathy: An rTMS/fMRI study
H. Bukowski, M. Tik, G. Silani, C. Ruff, C. Windischberger, C. Lamm

11:20am - 11:40am
Self-other blurring: A two-brain approach for understanding how empathy contributes to distress regulation
S. Shamay-Tsoory

11:40am - 12:00pm
Peripersonal space defines as self-other boundary during social interactions
A. Serino

Autism

Time: Saturday, 21/Jul/2018: 10:40am - 12:00pm · Location: CZ-2

10:40am - 11:00am
Differences in the bodily representation of emotion and interoception in autism and typical development
E. R Palser, A. Galvez-Pol, E. Pellicano, A.

Fotopoulou, J. M Kilner

11:00am - 11:20am
Autism and interoception: A fragmented internal world
T. R. Hatfield, R. Brown

11:20am - 11:40am
Ability to imitate emotional facial expressions is unrelated to empathy and emotion: Implications for autism and perception-action links.
C. F. Huggins, J. Williams, I. Cameron

11:40am - 12:00pm
Neural components of attention to own name as a social cue in young infants at low and high risk for Autism Spectrum Disorder
M. Arslan, P. Warreyn, N. Dewaele, J. R. Wiersema, E. Demurie, H. Roeyers

Social cognition II
Time: Saturday, 21/Jul/2018: 10:40am - 12:00pm · Location: CZ-3

10:40am - 11:00am
Modulation of behavioral and brain responses to visual perspective taking by social rejection: Evidence from electrophysiology
S. Peng, Y. Leng, H. Deng, S. Ge

11:00am - 11:20am
Age differences in prosocial influence
L. Foulkes, J. Leung, D. Fuhrmann, L. Knoll, S.-J. Blakemore

11:20am - 11:40am
Social problem-solving ability and forgiveness in interpersonal relationships: Effects on attributions and emotions
G. Stephanou

11:40am - 12:00pm
The role of the anterior insula in social norm compliance and enforcement: Evidence from coordinate-based and functional connectivity meta-analyses
G. Bellucci, C. Feng, J. Camilleri, S. B. Eickhoff, F. Krueger

SYMPOSIUM - Predictive processing approaches in affective neuroscience
Time: Saturday, 21/Jul/2018: 10:40am - 12:00pm · Location: CZ-4

10:40am - 11:00am
The role of arousal in the perception of facial expressions of emotion: An affective predictive processing approach
F. Ferreira-Santos

11:00am - 11:20am
The impact of facial expression predictions on social perception
L. Chanes, J. B. Wormwood, N. Betz, L. F. Barrett

11:20am - 11:40am
Understanding brain-body interactions in perceptual decision-making: How interoceptive prediction errors shape confidence
M. Allen

11:40am - 12:00pm
Expectations and experiences of fear: Dimensional contributions and neural underpinnings
A. B. Satpute

Attention
Time: Saturday, 21/Jul/2018: 10:40am - 12:00pm · Location: CZ-5

10:40am - 11:00am
Early neural mechanisms of overt attention
L. Kulke, A. Schacht

11:00am - 11:20am
Early contribution of FEF in orienting attention to faces: A TMS-EEG study
S. Torriero, G. Mattavelli, E. Lo Gerfo, L. J. Romero Lauro, R. Actis-Grosso, P. Ricciardelli

11:20am - 11:40am
Attentional and immunological adaptations to acute psychsocial stress
T. Kleinsorge, M. Claus, C. Watzl, V. Maydych

11:40am - 12:00pm
Visual and acoustic distraction in simulated car driving with young and older drivers
M. Karthaus, E. Wascher, S. Getzmann

POSTER SESSION II

Time: Saturday, 21/Jul/2018: 12:00pm - 1:30pm · Location: Boerhaaveplein

P2-01 The role of trait rumination in reward anticipation and consumption
N. Kocsel, E. Szabó, A. Galambos, A. E. Édes, D. Pap, R. Elliott, L. R. Kozák, G. Bagdy, G. Juhász, G. Kökönyei

P2-02 Altered perception-action binding modulates inhibitory control in Gilles de la Tourette syndrome
V. A. Petruo, B. Bodmer, V. Brandt, L. Baumung, V. Roessner, A. Münchau, C. Beste

P2-03 Can poor empathic skills be explained by cognitive flexibility deficits in depression?
K. El Bouragui, M. Rossignol, C. Besche-Richard

P2-04 Acting on observed social exclusion and pro-social behaviour in Autism Spectrum Disorders
C. Silva, C. Jover, F. Esteves, D. Da Fonseca, C. Deruelle

P2-05 Is the cerebellum linked to the Theory of Mind alterations in autism? A direct comparison between patients with cerebellar damage and subjects with autism spectrum disorder.
S. Clausi, M. Lupo, G. Olivito, F. Laghi, L. Siciliano, R. Baiocco, M. Bozzali, M. Masciullo, M. Molinari, M. Leggio

P2-06 Neuroticism effects on the valence of affect and depression. A serial mediation analysis on the levels of attentional and judgemental processing of emotional information
A. Wytykowska, M. Fajkowska, E. Domaradzka

P2-07 The serotonin transporter polymorphism moderates the influence of negative life events on depression in adolescents
C. Booth, E. Fox

P2-08 Rumination and violated expectation of pain: An fMRI study
G. Kokonyei, A. Galambos, A. E. Edes, N. Kocsel, E. Szabo, D. Pap, L. R Kozak, G. Bagdy, G. Juhasz

P2-09 Computational architecture of emotion coherence in Frontotemporal dementia
A. Musrah

P2-10 Effect of cooperative and non-cooperative social interactions on personal space regulation in adults with autism spectrum disorders: An fMRI study.
C. Massaccesi, A. Grössing, M. Hubinger, L. Rosenberger, H. Hartmann, G. di Pellegrino, M. Candini, F. Frassinetti, G. Silani

P2-11 Trait impulsivity associated with altered resting-state functional connectivity within the somatomotor network.
A. M. Herman, H. D. Critchley, T. Duka

P2-12 Affect arousal during the viewing of staged and real-life videomaterial
J. Skudra, E. Vanags

P2-13 Applied neuroscience: Deconstructing emotions in individual and couple therapy
J. P. Siegel

P2-14 Culture influences neural responses to affective stimuli across culturally similar and dissimilar situations
T. V. Vu, A. van der Meulen, D. Heslenfeld, K. Woodcock, S. Han, L. Krabbendam

P2-15 Development of web-based assessment frameworks for cognitive, emotional, and social functions: A preliminary study on facial emotion recognition
Y. K. Choi, H.-Y. Choi, S. Eom, H. Bahng, S. Shin, S. W. Jo, H.-J. Park

P2-16 Empathic modulation as a function of cognitive reappraisal and facial expressions.
K. C. Borja Jimenez, W. C. Williams, D. Ozkan, J. Zaki, C. Keysers, V. Gazzola

P2-17 Individual differences in emotion inference from visual narratives
J. Kim, Y. Kim, S.-H. Lee

P2-18 Neural substrates of item and source memory for emotional associates: an fMRI study
C. Ventura-Bort, Y. Katsumi, J. Wendt, J.

Wirkner, J. König, M. Lotze, A. O. Hamm, F. Dolcos, M. Weymar

P2-19 Neurophysiological processes and functional neuroanatomical structures underlying proactive effects of emotional conflicts
M. L. Schreiter, W. Chmielewski, C. Beste

P2-20 Recognition of mixed facial emotion has correlates in eye movement parameters
M. Konstantinova, K. Shedenko, L. Boiko, E. Kazimirova, O. Perepelkina, A. Latanov

P2-21 The effects of varying predictability about emotional content on affective picture processing: An event-related potential (ERP) study
A.-K. Johnen, N. Harrison

P2-22 The neural component process architecture of endogenous emotion generation
H. G. Engen, P. Kanske, T. Singer

P2-23 The role of facial proprioception during face expressions recognition
G. Mangiaracina, M. Ponari

P2-24 The role of the endogenous opioid system in emotion identification
Y. Zhao, M. Rütgen, C. Lamm

P2-25 To see or not to see? The neural representation of curiosity for negative images.
S. Oosterwijk, L. Snoek, J. te Koppele, L. Engelbert, S. Scholte

P2-26 A coordinate-based meta-analysis of neuroimaging studies on pain empathy: Investigating the role of visual information and perspective
J. Jauniaux, A. Khatibi, P. Rainville, P. L. Jackson

P2-27 Affect arousal and valence recognition from EDA asymmetry and HRV measurements during computerised cognitive ability testing
J. Ekmanis, E. Vanags

P2-28 Neural mechanisms of socio-emotional trait expression in voices
S. Guldner, F. Nees, H. Flor, M. Carolyn

P2-29 The role of interoception in emotion recognition
T. Isomura, M. Tsakiris

P2-30 Herding behavior: using brain stimulation to investigate its underlying neural processes
A. M. Dantas, P. S. Boggio, L. Murrins

P2-31 Learned Safety through Cognitive Evaluation: Bridging the gap between the extinction of conditioned responses and cognitive reappraisal
B. Macdonald, S. Hoare, T. Johnstone

P2-32 Transcutaneous vagus nerve stimulation: The effect of different stimulus intensities on cardiac vagal activity
U. Borges, S. Laborde, M. Raab

P2-33 The beat my heart didn't skip: interoceptive temporal prediction as an implicit measure of interoceptive awareness
C. E Palmer, R. Azevedo, M. Tsakiris

P2-34 The emotional Stroop task and sex hormones
A. Mohss, S. Möller, I. Sundström-Poromaa, E. Comasco

P2-35 Coupling of structural and functional brain networks explains communicative intelligence and personality traits
H.-Y. Choi, Y. K. Choi, J. Eo, C. Jang, S. Eom, C. Pae, H.-J. Park

P2-36 Differences in subjective time estimation of task duration has EEG -correlates in beta-subband
M. Konstantinova, V. Anisimov, A. Latanov

P2-37 Cognitive approach to Memristor which is able to associative learning
H. Babacan, S. Erkan

P2-38 Investigating the influence of transcutaneous vagal nerve stimulation (t-VNS) on learning in a predictive learning task.
M. D'Agostini, A. Burger, N. Claes, M. Weymar, I. Van Diest

P2-39 Sensitivity to probabilistic regularities during procedural learning: ERP evidence

A. Kóbor, K. Horváth, Z. Kardos, Á. Takács, K. Janacsek, D. Nemeth

P2-40 Effort can be rewarding depending on task context: The effects of task difficulty and reward contingency on the striatal activation in the brain
S. Meliss, M. Sakaki, K. Murayama, M. Matsumoto, Y. Yomogida, K. Matsumori, A. Sugiura, K. Matsumoto

P2-41 Self-serving bias during reward anticipation while bearing responsibility for others
D. M. Pfabigan, T. Wu, S. Zhou, X. Wu, S. Han

P2-42 Subjective expectation, but not objective reward probability, shapes evaluative feedback processing during performance monitoring at the FRN and P3 levels
W. Walentowska, M. C. Severo, A. Moors, G. Pourtois

P2-43 Gonadal hormones, nicotine and the Iowa Gambling Task
L. Focella, I. Sundström-Poromaa, E. Comasco

P2-44 Risk-taking behaviors have an impact on proactive control abilities
C. Roger, F. Grisetto, Q. Vantrepotte, T. Davin, A. Dinca, I. Desenclos, Y. Delevoye-Turrell

P2-45 Temporal and Effort cost decision-making in healthy subjects with high levels of psychosis-like symptoms
D. Terenzi, E. Mainetto, M. Barbato, R. I. Rumiati, M. Aiello

P2-46 Feedback processing in the context of social comparison
C. Valt, M. K. Sprengeler, B. Stürmer

P2-47 Improving the worst way to induce affect except for all the others
A. Uusberg

P2-48 The influence of moral identity on the processing of moral content
C. Pletti, J. Decety, M. Paulus

P2-49 Association between brief mindfulness training and the neural correlates of attention
G. L. de Lima Araujo, T. M. Almeida Silveira Mendes, D. Soares Brandão, N. Farb, M. B. Cordeiro de Sousa

P2-50 Automatic attention to members of ethnic ingroup and outgroup
T. Giménez-Fernández, U. Fernández-Folgueiras, S. Fondevila, C. Méndez-Bértolo, N. Aceves, M. J. García-Rubio, D. Kessel, L. Carretié

P2-51 Exogenous attention to threatening stimuli in motion
U. Fernández-Folgueiras, C. Méndez-Bértolo, M. Hernández-Lorca, C. Bódalo, S. Fondevila, T. Giménez-Fernández, L. Carretié

P2-52 Neural, somatovisceral, and behavioral correlates of cognitive bias interactions: The link between optimism bias and attention bias
L. Kress, L. Schüpbach, M. Bristle, R. Wiest, E. Hermans, T. Aue

P2-53 Auditory action-effect overlap does not modulate error-related ERPs in a flanker task
J. Horváth

P2-54 Competence-based social status modulates affective evaluation and dyadic motor coordination
S. Boukarras, V. Era, M. Candidi

P2-55 An event-based account of conformity: Cross cultural comparison
D. A. Kim, B. Hommel, R. Sellaro, K. Ma

P2-56 How motor pre-selection influences brain activity related to the observation of others' actions
G. Barchiesi, G. Demarchi, N. Weisz

P2-57 Machine learning provides novel neurophysiological features that predict performance to inhibit automated responses
A. Vahid, M. Mückschel, A.-K. Stock, C. Beste

P2-58 A causal role of parietal gain control mechanisms during cognitive flexibility
V. A. Petruo, C. Beste

P2-59 Baseline activation in brain areas involved in social cognition and cognitive control explains individual differences in cooperative behaviour

F. M. Dahinden, T. Baumgartner, L. R. Gianotti, D. Knoch

P2-60 EEG indices of error monitoring in immersive virtual reality
R. Pezzetta, V. Nicolardi, E. Tidoni

P2-61 Meditation-induced cognitive-control states affect the top-down control of feature binding
L. Prochazkova, R. Sellaro, L. Colzato, B. Hommel

P2-62 Modulation of theta oscillations and conflict processing – Connections in performance and neurophysiology
A. Bluschke, M. Mückschel, C. Pscherer, L. Summerer, C. Beste

P2-63 On the neural mechanisms underlying the adaptability to varying cognitive control demands
N. Zink, A.-K. Stock, A. Vahid, B. Christian

P2-64 Opposing effects of binge drinking on consciously vs. subliminally induced cognitive conflicts
A.-K. Stock, N. Wolff, C. Beste

P2-65 Response selection codes in neurophysiological data predict conjoint effects of controlled and automatic processes during response inhibition.
W. X. M. Chmielewski, M. Mückschel, C. Beste

P2-66 The attentional blink and dopamine markers
A. C. Trutti, Z. Sjoerds, B. Hommel

P2-67 The intensity of early attentional processing, but not conflict monitoring, determines the size of subliminal response conflicts
W. Bensmann, A. Vahid, C. Beste, A.-K. Stock

P2-68 The system-neurophysiological basis of developmental changes in sequential cognitive flexibility between adolescents and adults
F. Giller, R. Zhang, V. Roessner, C. Beste

P2-69 Pinging the brain - Uncovering hidden states that encode duration and orientation in working memory
J. de Jong, H. van Rijn, E. Akyürek

P2-70 The truth about energy drinks: Product presentation and cognitive effects
M. E. Vanutelli, I. Angileri, C. Lucchiari

P2-71 COMT Val/Met polymorphism does not modulate the effect of transcranial direct current stimulation on working memory in healthy humans
A. Loseva, B. J. Jongkees, M. Nitsche, L. S. Colzato

PARALLEL SESSIONS

Cognitive control
Time: Saturday, 21/Jul/2018: 2:30pm - 3:50pm · Location: CZ-1

2:30pm - 2:50pm
Mental control of temptation: The moderating role of BIS and BAS sensitivity
A. Wytykowska

2:50pm - 3:10pm
Revealing cognitive control processes in normal impulsivity by electrophysiological recordings
F. Grisetto, Y. Delevoye-Turrell, C. Roger

3:10pm - 3:30pm
Conflicting conflicts: The interplay of conflict monitoring processes
W. X. M. Chmielewski, C. Beste

3:30pm - 3:50pm
Towards a unitary model of human decision-making and action control
B. Hommel

SYMPOSIUM - The Social Cerebellum: New insights and evidence
Time: Saturday, 21/Jul/2018: 2:30pm - 3:50pm · Location: CZ-2

2:30pm - 2:50pm
New findings on role of the Cerebellum in understanding social action sequences
F. Van Overwalle

2:50pm - 3:10pm
Novel insight into understanding the cere-

bellar contribution to autistic-like symptoms.
G. Olivito, S. Clausi, M. Leggio

3:10pm - 3:30pm
TMS over the cerebellum reveals the role of the cerebellum in emotional and social processing
C. Ferrari, T. Vecchi, Z. Cattaneo

3:30pm - 3:50pm
The potential value of transcranial and electric stimulation of the cerebellum
K. van Dun, M. Manto

SYMPOSIUM - Putting interoception at the heart of social cognition: Addressing methodological, conceptual and research challenges
Time: Saturday, 21/Jul/2018: 2:30pm - 3:50pm · Location: CZ-3

2:30pm - 2:50pm
The relationship between alexithymia and interoception across domains and dimensions of measurement
J. Murphy, C. Catmur, G. Bird

2:50pm - 3:10pm
Happy infants, parents' brains: Social regulation of allostasis
S. Atzil

3:10pm - 3:30pm
The soothing function of social touch: electrophysiological and pharmacological studies on the social modulation of pain
A. Fotopoulou

3:30pm - 3:50pm
The Heartfelt Self: Contrasting the implicit and explicit impact of interoceptive signals on selfand socialawareness
M. Tsakiris

Face perception
Time: Saturday, 21/Jul/2018: 2:30pm - 3:50pm · Location: CZ-4

2:30pm - 2:50pm
Face perception investigated with simultaneous EEG-fMRI – The role of emotion, attention, and personal relevance
M. Bayer, T. Johnstone, I. Dziobek

2:50pm - 3:10pm
The contextual influence in the interpretation of facial expressions: A high-density EEG study on the Kuleshov effect.
M. Calbi, F. Siri, K. S. Heimann, D. Barratt, V. Gallese, M. A. Umiltà

3:10pm - 3:30pm
Design and implementation a fuzzy classifier for detecting the emotions of autistic children
M. Naeeni Davarani, A. Arian Darestani

3:30pm - 3:50pm
Does viewing one face prime interpretation of the next? The effects of emotion and gender
M. J. Davis, F. Maratos

Decision making
Time: Saturday, 21/Jul/2018: 2:30pm - 3:50pm · Location: CZ-5

2:30pm - 2:50pm
A good news and a bad news, which one do you want first? The importance of the sequence and the organization of information for a financial decision-making: A neuroelectrical imaging study
W. yang, J. Ma, M. Bonaiuto, A. G. Maglione, E. Modica, D. Rossi, G. Cartocci, F. Babiloni

2:50pm - 3:10pm
Age differences in neural correlates of feedback processing after economic decisions under risk
C. Fernandes, R. Pasion, A. Gonçalves, F. Ferreira-Santos, F. Barbosa, I. P. Martins, J. Marques-Teixeira

3:10pm - 3:30pm
Learning to balance fairness and self-interest: A reinforcement learning account
M. R. Giffin, M. Lebreton, J. Gross, C. De Dreu

3:30pm - 3:50pm
Prioritizing reward over cost information affects decision-making and task-performance: Evidence from behaviour and computational modelling.
E. Vassena, M. Blasco Oliver, W. H Alexander

SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off
Time: Saturday, 21/Jul/2018: 4:10pm - 5:50pm · Location: CZ-1

4:10pm - 4:30pm
Flexibility versus persistence: a metacontrol state model.
Z. Sjoerds, R. Sellaro, A. Trutti, V. Mekern, B. Hommel

4:30pm - 4:50pm
Voluntary task switching as a tool to investigate the flexibility-stability balance
K. Fröber, G. Dreisbach

4:50pm - 5:10pm
Shifting the balance: The role of context in shaping metacontrol policies.
R. van Dooren, I. Vergari, R. Sellaro, B. Hommel

5:10pm - 5:30pm
Effects of persistent vs flexible control mode on working memory
B. J. Jongkees, Y. Kessler, G. Dreisbach, L. S. Colzato

5:30pm - 5:50pm
Dopamine and decisions about cognitive control
R. Cools

SYMPOSIUM - How motivational and learning processes shape pain and avoidance
Time: Saturday, 21/Jul/2018: 4:10pm - 5:50pm · Location: CZ-2

4:10pm - 4:30pm
Opioid and BOLD mechanisms of how relative relief cues shape the pain experience
S. Leknes, C. Berna, I. Tracey

4:30pm - 4:50pm
Pain, fear and avoidance
J. Vlaeyen

4:50pm - 5:10pm
Generalization of learned pain modulation
L. Koban, T. D. Wager

5:10pm - 5:30pm
How pain and avoided pain drive learning: Two separate brain systems for pain-avoidance learning?
M. Jepma, M. Roy, A. Dahan

5:30pm - 5:50pm
Behavioral responses elicited by pain vs. relief learning
M. Andreatta, F. Kavcioglu, D. Gromer, P. Pauli

SYMPOSIUM - Reinforcement learning in a social world
Time: Saturday, 21/Jul/2018: 4:10pm - 5:50pm · Location: CZ-3

4:10pm - 4:30pm
Reinforcement learning creates ostracism in social groups
B. Lindström, P. Tobler

4:30pm - 4:50pm
From trust in groups to trust in individuals
P. Pärnamets, T. Granwald, A. Olsson

4:50pm - 5:10pm
Social learning and social motivation
G. Hein

5:10pm - 5:30pm
Associative learning of self and other ownership
P. L. Lockwood, M. Wittmann, M. Apps, M. Klein-Flugge, M. Crockett, G. Humphreys, M. Rushworth

5:30pm - 5:50pm
The role of empathy in learning to avoid harm to others
I. Patil, S. Campbell, W. Kool, M. Cikara, F. Cushman

Memory
Time: Saturday, 21/Jul/2018: 4:10pm - 5:50pm · Location: CZ-4

4:10pm - 4:30pm
Intentional mnemonic control under stress
C. Quaedflieg, T. Schneider, A. Engel, L. Schwabe

4:30pm - 4:50pm
Individual differences in working memory performance: An EEG study
Y. G. Pavlov, N. V. Pavlova

4:50pm - 5:10pm
Molecular substrates of recent vs. remote memory recall
P. Ghazal

5:10pm - 5:30pm
Post-error brain activity correlates with incidental memory for negative words
M. Senderecka, M. Ociepka, M. Matyjek, B. Kroczek

5:30pm - 5:50pm
How disgust and fear influences long-term memory of verbal unitizations – Measuring encoding-retrieval similarity with fMRI.
M. Riegel, M. Wierzba, M. Wypych, K. Jednoróg, A. Grabowska, A. Marchewka

Social decision making
Time: Saturday, 21/Jul/2018: 4:10pm - 5:50pm · Location: CZ-5

4:10pm - 4:30pm
The semiotics of the message and the messenger: Non-verbal information determines fairness perception in the Ultimatum Game
M. M. Spape, V. Harjunen, I. Ahmed, G. Jacucci, N. Ravaja

4:30pm - 4:50pm
Decoding proposers' motivations in the ultimatum game
S. P. H. Speer, M. A. S. Boksem

4:50pm - 5:10pm
Clear moral judgments based on unclear evidence: Person evaluation is strongly influenced by untrustworthy gossip
J. Baum, M. Rabovsky, S. Rose, R. Abdel Rahman

5:10pm - 5:30pm
Two shades of leader's trustworthiness: Electors from opposite sides of the political spectrum differ in the dispositional and situational trust toward a political leader
B. Gjoneska, G. Porciello, M. T. Liuzza, G. V. Caprara

5:30pm - 5:50pm
The role of ventromedial prefrontal cortex and temporo-parietal junction in third-party punishment behavior: A tDCS study
E. Lo Gerfo, A. Gallucci, R. Morese, S. Ottone, A. Vergallito, G. Locatelli, F. Bosco, F. Ponzano, R. L. Leonor Josefina

Sunday 22/07/2018					
9:00	SYMPOSIUM - In memory of John T. Cacioppo *Location: CZ-1* Organizer(s): Arvid Kappas & Claus Lamm	SYMPOSIUM - You only know when it's gone: neural (network) and behavioral effects of amygdalar lesions *Location: CZ-2* Organizer(s): Jan Van den Stock	Empathy *Location: CZ-3* Chair: Andrew Kenneth Martin	Perception and emotion *Location: CZ-4* Chair: David Terburg	SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach *Location: CZ-5* Organizer(s): Giorgia Silani
10:40	Coffee Break *Location: Boerhaaveplein*				
11:10	Social representation *Location: CZ-1* Chair: Elien Heleven	Psychopathology *Location: CZ-2* Chair: Colline Poirier	Decision making *Location: CZ-3* Chair: Blanca Rosa Olalde Lopez de Arechavaleta	Emotion regulation *Location: CZ-4* Chair: Corinna M. Perchtold	Agency *Location: CZ-5* Chair: Francesca Ciardo
12:20	Keynote Lecture III: Elaine Fox - The Contribution of Cognitive Biases and Genes to Psychological Wellbeing *Location: CZ-6 ("Burumazaal")*				
13:05-13:15	Closing *Location: CZ-6 ("Burumazaal")*				

PARALLEL SESSIONS

SYMPOSIUM - In memory of John T. Cacioppo

Time: Sunday, 22/Jul/2018: 9:00am - 10:40am · Location: CZ-1

9:00am - 9:20am
Reimagining the science of the human condition: On John Cacioppo's vision for social neuroscience
D. M. Amodio

9:20am - 9:40am
Affective space and emotion specificity in psychophysiology: John Cacioppo's legacy in emotion science
C. M van Reekum

9:40am - 10:00am
Whatever happened to the somatic nervous system? Revisiting John Cacioppo's early work on facial electromyography
E. J. Vanman

10:00am - 10:20am
The psychophysiology of empathy, emotion contagion, and loneliness
C. Lamm

10:20am - 10:40am
Complexity and beauty: The doctrine of multilevel analysis
A. Kappas

SYMPOSIUM - You only know when it's gone: neural (network) and behavioral effects of amygdalar lesions

Time: Sunday, 22/Jul/2018: 9:00am - 10:40am · Location: CZ-2

9:00am - 9:20am
Amygdala and threat-related action: Evidence from Urbach-Wiethe disease
D. R Bach

9:20am - 9:40am
Behavioral and neural processing of emotional expressions in frontotemporal dementia
L. Van de Vliet, F.-L. De Winter, M. Vandenbulcke, J. Van den Stock

9:40am - 10:00am
Effects of amygdala lesions on the neural processing of affective voices
S. Frühholz

10:00am - 10:20am
Investigation of emotion circuits in the brain of healthy volunteers and patients with anterior temporal lobectomy
Y.-A. Huang

10:20am - 10:40am
Amygdalae-motor connectivity and adaptive action
B. de Gelder

Empathy

Time: Sunday, 22/Jul/2018: 9:00am - 10:40am · Location: CZ-3

9:00am - 9:20am
Electrophysiological correlates of affective empathy in forensic patients with psychopathic traits
J. D. M. van Dongen, I. A. Brazil, I. H. A. Franken

9:20am - 9:40am
Promoting empathy with rhymes: Effects of poetry exposure on physiological arousal and empathic trait
G. Gabrieli, A. Truzzi, P. Rigo, L. Onnis, G. Esposito

9:40am - 10:00am
Connectivity architecture underlying brain activation for theory of mind: Converging or separable networks?
M. Schurz, M. Tholen, J. Perner, J. Sallet, R. Mars

10:00am - 10:20am
Improving cross-cultural "mind-reading" using electrical stimulation
A. K. Martin, P. Su, M. Meinzer

10:20am - 10:40am
Extra presentation
Mindfulness can mediate stress: as told by physiological markers
M. C. Pascoe

Perception and emotion
Time: Sunday, 22/Jul/2018: 9:00am - 10:40am · Location: CZ-4

9:00am - 9:20am
Emotional cues from faces modulate interoceptive cardiac processing
A. C. Marshall, A. Gentsch, S. Schütz-Bosbach

9:20am - 9:40am
Effects of emotional arousal on ambiguous motion perception
N. Turkileri, A. Ozsari, D. T. Field, M. Sakaki

9:40am - 10:00am
Empowering feedback connections in temporo-occipital network boosts visual perception of emotions
S. Borgomaneri, A. Avenanti

10:00am - 10:20am
Finding easy prey: Effects of testosterone on self-relevant threat detection
D. Terburg

10:20am - 10:40am
Prioritized neural coding of emotion cues during perceptual decision-making
E. Meaux, M. El Zein, R. Mennella, V. Wyart, J. Grèzes

SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach
Time: Sunday, 22/Jul/2018: 9:00am - 10:40am · Location: CZ-5

9:00am - 9:20am
Measuring social motivation
A. Hamilton, A. Georgescu, I. Dubey

9:20am - 9:40am
The neurochemical basis of emotion recognition and facial mimicry
S. Korb, C. Massacesi, M. Willeit, C. Eisenegger, G. Silani

9:40am - 10:00am
Pharmacology of male generosity: Role of dopamine and testosterone
P. Tobler, A. Soutschek, Y. Wu

10:00am - 10:20am
Opioid and oxytocin regulation of social reward processes in healthy humans
S. Leknes

10:20am - 10:40am
Wanting and linking of social and non social rewards: The role of dopamine and opioid.
S. Korb, C. Massaccesi, R. Rumiati, C. Eisenegger, M. Willeit, G. Silani

Social representation
Time: Sunday, 22/Jul/2018: 11:10am - 12:10pm · Location: CZ-1

11:10am - 11:30am
Identifying social representation in the brain using repetition suppression and enhancement: A meta-analysis
E. Heleven, F. Van Overwalle

11:30am - 11:50am
Neural representations of groups and stereotypes using fMRI repetition
J. Delplanque, F. Van Overwalle

11:50am - 12:10pm
The contribution of the left inferior frontal gyrus to the lexical-semantic representation of social categories: A TMS investigation of the relevance of affective processing
T. Suran, R. Rumiati, L. Piretti

Psychopathology
Time: Sunday, 22/Jul/2018: 11:10am - 12:10pm · Location: CZ-2

11:10am - 11:30am
Diagnostic accuracy of frontotemporal dementia. An artificial intelligence-powered study of symptoms, imaging, and clinical judgement.
M. A. Brzezicki, M. D. Kobetic, S. Neumann, C. Pennington

11:30am - 11:50am
Too tired to work: A computational framework of momentary motivational and subjective fatigue
M. A J Apps, T. Mueller, M. Jurgelis, M. Husain

11:50am - 12:10pm
The cumulative experience hypothesis of mood disorders.
C. Poirier, M. Bateson

Decision making
Time: Sunday, 22/Jul/2018: 11:10am -

12:10pm · Location: CZ-3

11:10am - 11:30am
Individual differences in intuitive and analytical thinking
B. R. Olalde Lopez de Arechavaleta

11:30am - 11:50am
Measuring emotional granularity through consistency in emotional decision-making.
C. F. Huggins, J. Williams, I. Cameron

11:50am - 12:10pm
Emotional prospection and decision-making
A. Bulley, B. Miloyan, G. Pepper, M. J Gullo, J. D Henry, T. Suddendorf

Emotion regulation
Time: Sunday, 22/Jul/2018: 11:10am - 12:10pm · Location: CZ-4

11:10am - 11:30am
The role of the right amygdala in emotion regulation: A human lesion study
L. Pruessner, S. Barnow, R. Freitag, K. Schulze

11:30am - 11:50am
The reappraisal inventiveness of the brain: Neural underpinnings of a new ability concept in cognitive reappraisal research
C. M. Perchtold, H. Weber, A. Fink, E. M. Weiss, C. Rominger, I. Papousek

11:50am - 12:10pm
Memory control and emotion regulation
S. Nørby

Agency
Time: Sunday, 22/Jul/2018: 11:10am - 12:10pm · Location: CZ-5

11:10am - 11:30am
Reduced sense of agency in human-robot interaction
F. Ciardo, F. Beyer, D. De Tommaso, A. Wykowska

11:30am - 11:50am
Temporal dynamics of rubber and virtual hand illusions
O. Perepelkina, V. Vorobeva, O. Melnikova, G. Arina, V. Nikolaeva

11:50am - 12:10pm
Only following orders? Differences in agency among civilians and military service members under coercion
E. A. Caspar, S. Lo Bue, P. A. Magalhães De Saldanha da Gama, P. Haggard, A. Cleeremans

ABSTRACTS

Session

SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice

Time: *Location:* **CZ-1**

Friday, 20/Jul/2018:
10:00am - 12:00pm

Organizer(s): **Alexander Soutschek**

Self-control, the capacity to choose valuable distant goals over immediate temptations, plays an important role in both individual and social decisions. Deficits in self-control are also among the defining symptoms of several disorders, including eating disorders such as obesity. It is thus of major importance to understand the neural mechanisms underlying self-control and their contribution to eating disorders. While the neural standard model of self-control in decision-making focusses on a fronto-striatal control network implementing impulse control, less is known about the contribution of alternative neural mechanisms to implementing self-control. The goal of this symposium is to shed light on neural mechanisms of self-control beyond the standard model and on the contribution of distinct self-control mechanisms to dietary decision-making and obesity. The topic of presentation 1 is how framing improves self-control and prosociality in social decisions independently of impulse control processes. Presentation 2 provides evidence for novel self-control mechanism in individual decisions that directs attention to an individual's future needs, a process neurally implemented by the temporo-parietal cortex. Presentation 3 sheds a new light in the role of dopamine in self-control, suggesting that dopamine mediates both the incentive value of immediate rewards and the exertion of self-control in order to achieve more distant rewards. Finally, the presentations 4 and 5 explore the contribution of distinct self-control strategies (emotion regulation and cognitive bias modification, respectively) to dietary choice in healthy and obese individuals.

10:00am - 10:20am

Framing effect in social discounting

M. Sellitto, A. Schweda, T. Kalenscher
Comparative Psychology, Heinrich-Heine University Düsseldorf, Germany

Being generous toward someone, namely sacrificing part of one's own resources for the benefit of others, has been shown to be modulated by the perceived social distance between the decision-maker and the other person (i.e., social discounting). Altruism can be seen as a conflict between the immediate sacrifices of generosity and the long-term benefits of social cooperation, thereby reflecting a special form of self-control. Several incidental factors can affect generosity, making it very malleable. In the present study we show how framing decisions can drive human prosocial behavior. In a within-subject design, volunteers first assigned, at each of several social distances depicted on a scale, specific persons from their social environment, from very close to strangers. Then, they made a series of binary monetary choices. In the gain frame, they chose between a selfish option higher in amount —gain for the participant and no gain for the other person— and a generous option lower in amount —same gain for the participant and the other person. In the loss frame the same options were presented but, in spite of equivalent expected payoff values across frames, choosing the selfish option in this frame entailed a loss for the other person. As main finding, the loss frame had a strong impact on generous behavior as measured via hyperbolic discount rates. Specifically, participants were significantly more altruistic in the loss frame as compared to the gain frame, especially toward other persons at large social distances. Functional mechanisms underlying this process will be discussed.

10:20am - 10:40am

Causal role of temporo-parietal junction for future-orientation in self-control: a TMS-fMRI study

A. Soutschek, M. Moisa, C. Ruff, P. Tobler
Department of Economics, University of Zurich, Switzerland

The ability to delay gratification is an important cornerstone of individual and societal well-being. While most research on the neural basis of self-control focusses on the prefrontal control network, we recently showed that also the TPJ causally contributes to delaying gratification. However, the precise neural mechanisms underlying the TPJ's contribution to self-control have not been clarified yet. Here, we used combined TMS-fMRI to test the hypothesis that the TPJ increases the subjective value of delayed rewards by enabling subjects to overcome present bias. Participants performed a temporal discounting task and a mental time travel task in the MRI scanner before and after receiving TMS over the TPJ or the vertex (control site). We found that disrupting TPJ functioning reduced future orientation in both the temporal discounting and the mental time travel task, suggesting that the TPJ is causally involved in overcoming present bias. On a neural level, TPJ showed enhanced functional connectivity with value-coding brain regions in the striatum. Consistent with the behavioural stimulation effects, TPJ-striatum coupling was reduced following TPJ TMS. Taken together, our findings provide evidence for a self-control mechanism implemented by the TPJ that promotes overcoming present bias by increasing the subjective value of future rewards.

10:40am - 11:00am

Dopamine and proximity effects in cognitive control

A. Westbrook
Motivation & Cognitive Control Lab, Donders Institute, Netherlands, The

Cognitive control keeps us on task, but is subjectively costly and must be motivated just like physical effort. Yet while incentives promote physical effort, they sometimes promote control and other times undermine it, yielding impulsivity. A potential explanation is that physical actions benefit from "proximity," i.e., they are immediately suggested by the environment (e.g. levers at hand, stairs underfoot). Cognitive control actions are, by contrast, psychologically distant. Successful control requires overcoming effort costs and differences in action proximity. Interestingly, dopamine (DA) may mediate both dimensions, but with opposing effects on cognitive control. In this talk I will discuss a novel hypothesis that, during action selection, striatal DA emphasizes the benefits of actions over their costs, but it does so preferentially for proximal actions. In turn, I will discuss how proximity can determine whether striatal DA signaling promotes or undermines control and how a proximity bias may be normative for action selection. Finally, I will discuss recent work testing the putative DA-proximity interaction.

11:00am - 11:20am

Are emotion regulation processes and skills related to dietary self-control?

S. U. Maier[1,2], T. A. Hare[1]
[1]Department of Economics, Laboratory for Social and Neural Systems Research, University of Zurich, Switzerland; [2]Institute for Biomedical Engineering, Translational Neuromodeling Unit, ETH Zurich and University of Zurich, Switzerland

Longitudinal studies have associated self-regulation with desirable outcomes such as health, wealth and social connectedness. However, we do not know whether and how regulatory skills transfer across domains, and our ability to explain and predict individual variability in these skills is limited. We addressed these issues by combining both physiological (e.g. fMRI and heart-rate-variability, HRV) and behavioral measures of emotion reappraisal with dietary self-control tasks to investigate links between regulatory successes across domains.
In the emotion reappraisal task, participants viewed standardized positive and negative photos without altering their feelings, or reappraised the content to dampen the elicited emotions. In the dietary self-control task, participants chose between eating healthy items and highly palatable junk-food options.
Within each behavioral task, we found BOLD activity consistent with previous findings on emotion reappraisal and dietary choice. When comparing across tasks, we found that better dietary self-control was associated with increased BOLD activity during successful emotion reappraisal trials ($p < 0.05$, whole-brain corrected). This suggests an overlap in the neural systems involved in dampening reactions to emotional scenes and choices over appetitive or aversive foods. In addition to the brain results, we also found that HRV, a physiological measure previously associated with better emotion regulation, can be used to improve the accuracy of predictions about dietary self-control ability beyond those generated from standardized questionnaire responses alone.

11:20am - 11:40am

Unhealthy yet avoidable - How cognitive bias modification alters behavioral and brain responses to food cues in obesity

N. Mehl[1], F. Morys[1,3], A. Villringer[2,4], A. Horstmann[1,3,4]
[1]O'BRAIN Lab / Neurology, Max Planck Institute for Human Cognitive and Brain Sciences, Germany; [2]Neurology, Max Planck Institute for Human Cognitive and Brain Sciences; [3]IFB AdiposityDiseases, Leipzig University Medical Center; [4]SFB 1052 'Obesity Mechanisms'

Obesity is associated with approaching rather than avoiding problematic stimuli, such as unhealthy food. This behavior is driven by automatic processing of food cues, making it difficult to inhibit unwanted responses. Obesity therapies mainly focus on explicit knowledge instead of implicit behaviors. In contrast, cognitive bias modification (CBM) aims to alter automatic behaviors by turning problematic approach tendencies into beneficial routines. Underlying mechanisms targeted by CBM in obesity are yet unclear. Candidate mechanisms are (a) altering reward values of food stimuli or (b) strengthening inhibitory abilities. 34 obese individuals completed either a CBM or a sham training during fMRI scanning. The CBM condition consisted of an implicit training to approach healthy and avoid unhealthy food. At baseline, all subjects showed an approach bias towards food. Activity in the right angular gyrus (rAG) was higher when avoiding versus approaching food. This relates to resolving stimulus response conflict and behavioral control. CBM training diminished the behavioral approach bias towards unhealthy food, decreased activation in the rAG, and increased activation in the anterior cingulate cortex. Relatedly, functional connectivity between rAG and the right superior frontal gyrus increased. Further, resting-state fMRI functional connectivity increased between brain regions important for inhibitory control, such as the left middle frontal gyrus, anterior insula and right middle frontal gyrus, but also between the left inferior frontal gyrus and left nucleus accumbens. CBM seems to strengthen behavioral inhibition when faced with unhealthy foods by targeting mostly inhibitory brain regions, thus indicating the efficacy of implicit interventions in obesity.

11:40am - 12:00pm

Extra presentation - it is not part of this symposium, but on a closely related topic.

How health goal priming promotes healthy food choice: a virtual reality fMRI study

N. van der Laan[1], E. Papies[2], A. Ly[1], P. Smeets[3,4]
[1]Amsterdam School of Communication Research, University of Amsterdam, Netherlands, The; [2]Institute of Neuroscience and Psychology, University of Glasgow, United Kingdom; [3]Division of Human Nutrition, Wageningen University & Research; [4]Image Sciences Institute, University Medical Center Utrecht, The Netherlands

Health goal priming is an effective intervention for stimulating healthy food choices: an external cue increases the mental accessibility of a consumer's long-term goal of eating healthy and thereby facilitates healthy food choices. Healthy food choices require modulation of the ventromedial prefrontal cortex (vmPFC) value signal by the dorsolateral prefrontal cortex (dlPFC). Explicit cues (task instruction) which focus attention on health influence this vmPFC-dlPFC self-control mechanism and promote healthier food choices. It is unknown how more implicit cues, like those used in health goal priming, affect the neural correlates of food choice to impact choice. Earlier studies employed simplified choice paradigms, while food choice settings in dailylife are far more complex. Therefore, we developed and validated a virtual supermarket paradigm for use in behavioral and neuroimaging research. We performed an fMRI study (n=56) employing this paradigm to assess the neurocognitive drivers of health goal priming. Choices between healthy and unhealthy foods were preceded by a health, hedonic, or control prime. No main effect of prime condition on preference for healthy products or brain activation during choice in vmPFC and dlPFC was found. However, it was found that in the individuals where the health primes successfully promoted healthier food choices, these primes triggered a brain mechanism involved in self-control comprising the dorsolateral prefrontal cortex. To conclude, the NeuroShop is suitable to investigate the neural correlates of food choice and we were the first to demonstrate that health goal priming might be effective in changing food choice through triggering neural self-control mechanisms.

Session

SYMPOSIUM - Heterogeneity in autism spectrum disorders

Time: **Friday, 20/Jul/2018: 10:00am - 12:00pm**

Location: **CZ-2**

Organizer(s): **Giorgia Silani**

Autism spectrum disorder (ASD) is a developmental condition characterized by impairments in everyday social interactions and social cognition. Even if commonly considered a quite homogenous condition, the expression of the symptoms varies to a greater extend depending on personality, social and educational factors as much as cognitive resources. In this symposium, we aim at bringing together scholars that have contributed to the

understanding of this condition, both in children and adult populations. A broad range of topics will be covered, from how social interaction modulates personal space regulation to the analysis of the relationship between cognitive skills, adaptive functions and social deficits. The contribution by Francesca Frassinetti will address the question of how social interactions can influence peri-personal and inter-personal space perception in children with ASD. Giorgia Silani will expand this by bringing evidence on the neural systems processing personal space intrusion in adults with ASD. Geoff Bird will present findings on the impact of subclinical trait such as alexithymia on social cognition in ASD. Finally Caroline Moessnang and Julian Tillmann will talk about recent data of the Longitudinal European Autism Project (LEAP), related to the development of the social brain and the relationship between cognitive skills, adaptive functions and social deficits in ASD. By presenting studies that combine multi-methods approaches and perspectives, we aim at giving an exhaustive overview on the most up to date research on autism spectrum disorders.

10:00am - 10:20am

Plasticity of space around the body: functional dissociation between social and action space in ASD children

F. Frassinetti[1,2], G. di Pellegrino[1,3], V. Giuberti[4], S. Erica[4], M. Candini[1]

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The space around the body has defined as an action space, peripersonal space, and as a social space in which the interactions with others occur, interpersonal space. These spaces are plastic: the peripersonal space can be extended by tool-use, and the interpersonal space can be shrunk following a social interaction. Recent studies revealed that interpersonal space is larger and less plastic in children with autism (ASD) than in children with typical development (TD). An intriguing question is whether autism affects the regulation of the space around the body as a whole or, alternatively, it selectively affects the interpersonal but not the peripersonal space. To this aim, TD and ASD children were submitted to the Reaching- and Comfort-distance tasks adopted as index of peripersonal and interpersonal spaces, respectively. Participants moved toward a confederate or toward an object of similar size. They were asked to stop when they could reach stimuli (Reaching task) or when they felt comfortable with stimuli's proximity (Comfort task). Both tasks were performed before and after a cooperative tool-use training in which participant and confederate actively cooperated to reach tokens placed behind the reaching distance. Interestingly, in TD children, following the cooperative tool-use training an extension of peripersonal space and a selective reduction of interpersonal space with the confederate were found. Conversely, in ASD children, peripersonal space was extended whereas interpersonal space did not change after training. These results demonstrate a functional dissociation between action and social spaces and a deficit restricted to social space regulation in autism.

10:20am - 10:40am

Effect of cooperative and non-cooperative social interactions on personal space regulation in adults with autism spectrum disorders: an fMRI study.

C. Massaccesi[1], A. Grössing[1], M. Hubinger[1], L. Rosenberger[2], H. Hartmann[2], G. di Pellegrino[3], M. Candini[3], F. Frassinetti[3], G. Silani[1]

[1]Department of Applied Psychology: Health, Development, Enhancement and Intervention, University of Vienna, Austria; [2]epartment of Basic Psychological Research and Research Methods, University of Vienna, Austria; [3]Department of Psychology, University of Bologna, Italy

Personal Space (PS) is the space immediately surrounding an individual and it can be regulated during social interactions. Intrusion into this space by others can generate feelings of discomfort. Importantly, in the case of autism spectrum disorder (ASD), the regulation of PS is often altered compared to typically developing (TD) children and/or not modulated by changes in the quality of experienced social interactions. This study aimed to investigate the behavioral and neurophysiological underpinning of PS and its modulation by different types of social interactions in Adults ASD participants.
Fifteen ASD and fifteen TD underwent fMRI investigation while presented with several prerecorded videos of an actor moving a predetermined number of steps towards them. They were asked to specify how comfortable they felt in regard to the observed distance. In order to see the effect of social interactions on PS perception, participants and confederates played a repeated trust game, in which cooperative and non-cooperative interactions were manipulated. After the game, participants were confronted a second time with the distance task.
We observed a significant modulation of the trust game on comfort ratings both in TD and ASD. Notably, only TD, and not ASD, showed increased activity in emotional/saliency brain areas (bilateral insula). Moreover, ASD showed a general reduction of activity in the intraparietal sulcus, a region involved in the observation of approaching stimuli and associated to higher sociability in healthy participants. The findings suggest differences between ASD and TD in the neural processing of the emotional saliency of an approaching person.

10:40am - 11:00am

The contribution of alexithymia to social cognition in autism.

G. Bird

Experimental Psychology, University of Oxford, United Kingdom

In our recent work we have been trying to separate the impact of autism and alexithymia on social cognition. The talk will provide an overview of this research and examine the degree to which it can be explained within recent computational accounts of autism focussing on the processing of interoceptive information. Specifically, I will talk about the impact of alexithymia on emotion recognition and empathy, before reporting on a potential role for alexithymia in the non-social symptoms of autism.

11:00am - 11:20am

A functional imaging investigation of social brain development in the Longitudinal European Autism Project (LEAP) cohort

C. Moessnang[1], U. Braun[1], S. Baumeister[2], V. Frouin[3], S. Baron-Cohen[4], S. Durston[5], A. Persico[6,7], W. Spooren[8], D. Murphy[9], E. Loth[9], J. Buitelaar[10], T. Banaschewski[2], D. Brandeis[2,11], H. Tost[1], A. Meyer-Lindenberg[1]

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Neuroscience, King's College London, United Kingdom; [10]Donders Institute for Brain, Cognition and Behaviour, Radboud University Nijmegen Medical Centre, The Netherlands; [11]Department of Child and Adolescent Psychiatry and Psychotherapy, Psychiatric Hospital, University of Zürich, Switzerland

The social brain is assumed to play a key role in neurodevelopmental conditions, such as autism spectrum disorder (ASD), but its functional maturation is incompletely understood. Here, we characterize social brain responses during a spontaneous mentalizing task in 224 typically developing (TD) individuals and 264 individuals with ASD aged 6 to 30 years. Functional data was analyzed in three complementary ways, including 1) the analysis of stimulus-locked changes in signal strength (i.e., activation), 2) the analysis of stimulus-locked and stimulus-independent synchronization between brain regions (i.e., connectivity), and 3) the application of network modeling approaches to assess system segregation, a putative marker of network maturation. We observed robust effects of task, but no clear-cut effects of age and diagnosis on stimulus-locked responses of the social brain. Age was inversely correlated with stimulus-locked activation in the executive control network. Similarly, no effects of age and diagnosis were observed for stimulus-independent synchronization of single social brain regions. However, their collective behavior as assessed by network modeling revealed a general increase of segregation of the social brain system with increasing age during active mentalizing. In addition, we observed a specific reduction of social brain system segregation from the default mode network in ASD. Collectively, these results suggest that task-locked responses of the social brain to spontaneous mentalizing are well developed by the age of 6 in both TD and ASD subjects. Complex network interactions, in contrast, show continuing maturation of the social brain and suggest a specific loss of functional compartmentalization in ASD.

11:20am - 11:40am

Investigating the factors underlying discrepancies in IQ and adaptive functioning in ASD in the EU-AIMS Longitudinal European Autism Project (EU-AIMS LEAP)

J. Tillmann, E. Loth, T. Charman

IoPPN, King's College London, United Kingdom

Many individuals with Autism Spectrum Disorder (ASD) exhibit significant impairments in adaptive functioning that impact on their ability to meet the demands of everyday life. A recurrent finding is that there is a pronounced discrepancy between the level of overall cognitive ability and adaptive functioning, and this is particularly prominent among higher-ability individuals. However, the factors that underlie these discrepancies remain poorly understood.Here we investigated adaptive function and IQ-adaptive functioning discrepancies in a large sample of 417 children, adolescents and adults with ASD as part of the EU-AIMS LEAP cohort. We examined the impact of age, sex, IQ, levels of ASD symptom severity and psychiatric symptomatology.Results demonstrate that older age, lower IQ and higher current social symptoms are associated with both lower adaptive functioning and greater IQ-adaptive functioning discrepancy scores. Sensory ASD symptoms and symptoms of Attention Deficit/Hyperactivity Disorder (ADHD), Anxiety and Depression were not associated with adaptive functioning or IQ-adaptive functioning discrepancy.These findings offer novel insights into the unique factors that influence variability of adaptive functioning and IQ-adaptive functioning discrepancies in ASD. Core social communication impairments are associated with adaptive function impairments but sensory symptoms and associated psychiatric symptoms are not. These findings have implications for supportive interventions across the lifespan to promote independence in individuals with ASD.

11:40am - 12:00pm

Extra presentation - it is not part of this symposium, but on a closely related topic.

Neuroimaging evidence for different facets, dimensions, and types of alexithymia

K. S. Goerlich

Department of Neuroscience, University Medical Center Groningen, Netherlands, The

Alexithymia is a personality construct at the interface of cognition and emotion that has attracted scientific interest for four decades now. Since the first neuroimaging study in the beginning of the millennium, neuroscientific research has continued to reveal the underpinnings of alexithymia in the brain, linking the construct to dysfunction in brain regions mediating cognitive-emotional processing. Here, I provide an overview of the brain regions exhibiting alterations in function and structure in relation to alexithymia and its different facets. Further, neuroimaging evidence for the existence of a cognitive and an affective dimension of alexithymia will be presented, and the usefulness of differentiating between different dimensions and types of alexithymia will be discussed. Finally, the clinical implications of these findings will be addressed and directions for future research will be provided.

Session

SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation

Time: *Location:* **CZ-3**

Friday, 20/Jul/2018:
10:00am - 12:00pm

Organizer(s): **Sebastian Schindler**

For humans, as social beings, social and affective information is processed with priority, leading to distinct brain responses. Socio-affective factors also strongly affect memory formation. In this symposium, studies on socio-affective influence on stimulus processing and learning are presented in a series of studies, combining electro- and magnetoencephalography, peripheral physiology and behavioral measures. First, individual sensitivity towards social feedback is explored. Heart rate variability during resting-state is used to predict theta oscillations elicited by social evaluative feedback. In a second talk, ERP responses towards social feedback are combined with subsequent memory effects. Social feedback, compared to instructed learning, lead to ERP modulations, higher memory accuracy, but also to a positivity-bias, specifically when feedback originated from relevant senders. A third presentation shows how social signals can be learned via olfactory channels, presenting MEG responses towards anxiety-sweat associated faces. In a fourth talk, targeting social learning, EEG responses and behavioral effects for reward-learning are presented, either based on own performance or on social observation. The fifth and final presentation shows reversal learning during threat-of-shock. While skin conductance responses were more pronounced following wins, unexpected losses were associated with pronounced feedback-related negativity (FRN) and P3 amplitudes. Importantly, reversal learning was slower when anticipating aversive events. These results address the effects of socio-affective context on our brains and behaviour, and highlight its differential influences on perception, learning and memory

formation. These encompass stronger responsiveness to social feedback, learning from social feedback, social signals and social observation and selective influences of threat in reversal learning.

10:00am - 10:20am

Beating the suspense!!! Heart rate variability as a predictor of rejection sensitivity?

M. J. van der Molen[1], E. Kortink[1], B. Verkuil[2], L. Colzato[3], W. Weeda[4]

[1]Developmental Psychology, Institute of Psychology, Leiden University, Netherlands, The; [2]Clinical Psychology, Institute of Psychology, Leiden University, Netherlands, The; [3]Cognitive Psychology, Institute of Psychology, Leiden University, Netherlands, The; [4]Methodology and Statistics, Institute of Psychology, Leiden University, Netherlands, The

Neurovisceral integration theory posits that vagally mediated heart rate variability (HRV) offers an index of adaptive functioning of the brain's threat-detection system. Here we will test this notion by examining whether baseline HRV can be used to predict neural reactivity to peer rejection feedback. Previous studies have collectively demonstrated that unexpected peer rejection feedback – a prominent social threat – induces significant reactivity of frontal-midline theta (FM theta) oscillations. We hypothesize that this FM theta response to a social stressor represents an adaptive response, governed by a neurovisceral mechanism. In our study, participants were administered the social judgment paradigm. In this task, participants were led to believe that their portrait photograph was evaluated by a group of peers (based on first impression ratings: like vs dislike). In the lab, participants were shown photos of each peer 'judge' and had to predict whether this peer liked or disliked the participant. Baseline HRV was used to predict participant's FM theta responsivity when processing unexpected rejection feedback. Individual differences in this brain-heart association were examined via community structure analyses – a network-theoretical approach to parse rejection-sensitive personality profiles. Results of this study should yield important insights in the neurovisceral correlates of social-evaluative feedback processing.

10:20am - 10:40am

"I remember that" - Social context amplifies ERP responses and simultaneously enhances and biases memory performance

J. Kissler[1], S. Schindler[1,2]

[1]Affective Neuropsychology, Bielefeld University, Germany; [2]Institute of Medical Psychology and Systems Neuroscience, University of Muenster, Germany

In the age of virtual communication, the source of a message is often not directly perceived but rather implied. In a recent series recent series of ERP studies, attributed 'human' feedback was compared to computer feedback. Putatively, senders gave on-line written positive, negative, or neutral personality feedback while high-density EEG was recorded. In reality, all conditions contained random but counterbalanced feedback. ERP results showed consistently early sender effects, starting with the P2 or EPN, sustaining until the LPP. In the present study, memory formation for such social feedback is examined. In an experimental group, participants received human- and computer-feedback based on positive, negative, or neutral adjectives and could agree with the feedback or not. Feedback acceptance was highest for positive and lowest for negative adjectives, while overall higher for putative human feedback. The enhanced relevance of positive feedback was reflected in substantially enhanced parietal LPP amplitudes, while human emotional feedback led to a stronger late frontal positivity. In a control group, participants were instructed to learn the very same stimuli. Although a recognition test one week after testing was unexpected, memory accuracy was overall higher and a significantly more liberal responding towards positive words was observed for the social-feedback group. These findings show that attributed sender identity not only enhances feedback-processing, but also facilitate memory encoding. Specifically, in social contexts, our brains rapidly differentiate between relevant and irrelevant information. This can lead to better encoding, but however, also to larger response biases.

10:40am - 11:00am

Preferential processing of anxiety sweat associated faces: Magnetoencephalographic correlates

I. Klinkenberg[1], C. Steinberg[1], M. Rehbein[1], I. Wessing[1], P. Zwitserlood[2], M. Junghöfer[1]

[1]Institute of Biomagnetism and Biosignalanalysis, University Hospital Münster, Germany; [2]Institute of Psychology, University of Muenster, Germany

Humans seem to be able to express and perceive anxiety olfactorily via chemosignals contained within anxiety sweat. To investigate olfactory communication and learning of anxiety information, we paired 104 neutral faces (conditioned stimuli, CS) three times with either anxiety or control sweat (unconditioned stimuli, UCS) in a challenging learning paradigm (MultiCS-conditioning). Magneto-encephalographic brain responses to CS faces, as well as behavioral ratings and self-report were assessed before and after conditioning. After conditioning, anxiety-sweat-paired faces provoked stronger neural correlates of enhanced emotional processing than control-sweat-paired faces. Components were very early and long-lasting, with a frontal component from 90 to 110 ms and a long-lasting EPN-m between 170 and 540 ms. Estimated neural sources of the EPN-m component were found in the right parieto-temporal cortex and in the PFC. Importantly, participants showed no trace of face-odor contingency awareness and were unable to differentiate between anxiety and control odor. We therefore conclude that olfactory anxiety information can modulate early and later stages of visual processing, even though perceived outside of awareness. Moreover, results speak in favor of human sweat containing information about the emotional state of the sweat donor, most likely conveyed via chemosignals.

11:00am - 11:20am

Chocolate incentives – Reward preferences in active and observational feedback processing

J. Peterburs, C. Bellebaum

Biological Psychology, Heinrich-Heine-University Düsseldorf, Germany

The feedback-related negativity (FRN) codes action outcomes along a favorable/unfavorable as well as an expected/unexpected dimension. Recent research suggests that it also reflects a more fine-grained evaluation that may include factors such as subjective reward preferences and active action execution versus observation of someone else's actions. The present study investigated the modulation of typical reward-related ERPs (P2, FRN, and P300) by individual reward preferences in an active and observational setting. 47 healthy adult subjects with distinct preferences for either milk or white chocolate completed two runs of a task involving responses and preferred, non-preferred or neutral (non-chocolate) rewards while EEG was recorded. In the 'active' run, subjects chose between three different response options and received the different types of rewards. In the 'observational' run, they observed choices and subsequent rewards in another person. In line with our hypotheses, FRN magnitude was modulated by individual reward preferences, with more negative amplitudes for non-

preferred compared to preferred and neutral rewards, irrespective of action context. The P300 was largest following preferred rewards and did not distinguish between non-preferred and neutral rewards. The attention-sensitive P2 was more pronounced for chocolate versus non-chocolate rewards. P2 and P3 result patterns were more pronounced in the active than the observational context. The present study adds to evidence for modulation of feedback processing by action context (active vs. observation) and subjective reward preferences. Our findings suggest that preference-related reward expectations are modulated by early attentional processes as well as motivational factors reflected in later stages of evaluative processing.

11:20am - 11:40am

Neural and behavioral correlates of reward reversal learning: Decision making under threat

F. Bublatzky, S. Schellhaas, G. Koppe, C. Schmahl, C. Paret

Central Institute of Mental Health, Medical Faculty Mannheim, University of Heidelberg, Germany

Predicting the consequences of one's own decision is crucial to organize adequate future behavior. When reward contingencies vary, however, the flexible adjustment of decisions may be impaired by concurrent threatening conditions. Two studies tested the impact of verbally instructed threat-of-shock on choice behavior, electrocortical processing (N=30), and psychophysiological responding (N=35). In a probabilistic decision making task, participants had to choose between two female faces which were either contingent with monetary gains or losses. Behavioral options were differently reinforced and reward contingencies were reversed after reaching a probabilistic threshold of 6-9 correct choices. Decision making and reversal learning was tested with two contextual background colors which were instructed as signals for threat-of-shock or safety. As a manipulation check, self-report data confirmed that threat relative to safety condition was perceived as more unpleasant, arousing, and threatening. Indicating enhanced autonomic arousal during threat compared to safety, skin conductance responses were more pronounced following congruent win but not loss feedback. Moreover, preliminary ERP analyses revealed that unexpected losses were associated with pronounced feedback-related negativity (FRN) and P3 amplitudes. Overall, behavioral performance was comparable during threat and safety condition (reaction times and error rates). Regarding reversal learning, however, participants made more errors during threat compared to safety condition. Thus, when anticipating aversive events, more mistakes were needed until participants successfully readjusted to profitable choice behavior. These findings are discussed in terms of operant reversal learning mechanisms with implications for emotion regulation and anxiety disorders.

This work was supported by the German Research Foundation (BU 3255/1-1).

11:40am - 12:00pm

Extra presentation - it is not part of this symposium, but on a closely related topic.

Maternal oxytocin responsiveness promotes positive social memory recall

W. S. Tse[1], A. F. Y. Siu[2], Q. Zhang[3], E. H. Chan[3]

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Oxytocin is related to positive parenting behaviours and social cognition. Long-term relationships are partly influenced by the social memory of a person. Positive social memory with the attachment figure may play a mediating role between oxytocin responsiveness and positive parenting behaviours. The study recruited 61 pairs of married mothers and preschool children from a community. Sociodemographic background and neuroticism data of the respondents were collected in a laboratory. Salivary oxytocin and current mood rating were obtained 10 and 15 min before and after free play, respectively. After collecting the second salivary oxytocin samples, the mothers engaged in a parenting recall task. The mothers with high oxytocin responsiveness recalled previous positive social events with great detail and used uncontrollability attribution to explain such positive events. Oxytocin responsiveness influenced the recall of positive social events and attribution. This influence may enhance the sensitivity and positive behaviours of parenting.

Session

SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential

Time: *Location:* **CZ-4**

Friday, 20/Jul/2018:
10:00am - 12:00pm

Organizer(s): **Lorenza Colzato & Bart Verkuil**

In his seminal book "The Expression of Emotions in Man and Animals" (1872/1965), in conversation with Claude Bernard, Charles Darwin was the first to suggest a psychological function of the so-called "pneumo-gastric" nerve, nowadays known as the vagus nerve. Only in recent years, investigating the connection between the vagus nerve and human cognition in a systematic fashion became possible through the development of CE approved, non-invasive, transcutaneous (through the skin) vagus nerve stimulation (tVNS) devices. This interdisciplinary symposium will consider (a) the neural underpinnings via release of the neurotransmitter noradrenaline and (b) the clinical potential via enhancing explicit fear extinction and decreasing chronic worrying.

10:00am - 10:20am

Transcutaneous vagus nerve stimulation (tVNS) enhances recognition of emotions in moving but not static bodies

L. S. Colzato[1,2], M. J. Maraver[1], P. Ricciardelli[3], R. Actis-Grosso[3], L. Steenbergen[4]

[1]Leiden University, Cognitive Psychology Unit & Leiden Institute for Brain and Cognition, Leiden, The Netherlands; [2]Department of Cognitive Psychology, Institute of Cognitive Neuroscience, Ruhr University Bochu; [3]University of Milano-Bicocca; [4]University of Amsterdam

The polyvagal theory suggests that the vagus nerve is the key phylogenetic substrate enabling optimal social interactions, a crucial aspect of which is emotion recognition. Previous studies showed that the vagus nerve plays a causal role in mediating people's ability to recognize emotions based on images of the eye region, whole faces but not static bodies. The aim of this study is to verify whether the previously reported causal link between vagal activity and emotion recognition can be generalized to situations in which emotions must be inferred from images of whole moving bodies. To this end, we employed transcutaneous vagus nerve stimulation

(tVNS), a novel non-invasive brain stimulation technique that activates the auricular branch of the vagus nerve, located in the anterior protuberance of the outer ear. In two separate sessions, participants received active or sham tVNS before and while performing two emotion recognition tasks, aimed at indexing their ability to recognize emotions from static or moving bodily expressions. Active tVNS, compared to sham stimulation, enhanced the recognition of anger for moving but not static bodies. The ability to recognize a moving angry bodily expression fits with the evolutionary perspective suggesting that natural selection resulted in a propensity to react more strongly to negative than to positive stimuli. If one considers that people's fight/flight response strategies are more likely to rely on anger, the present findings are in line with the proposed role of the vagus nerve to regulate social engagement via emotion recognition.

10:20am - 10:40am

Transcutaneous vagus nerve stimulation (tVNS) enhances conflict-triggered adjustment of cognitive control

R. Fischer[1], C. Ventura-Bort[2], A. Hamm[1], M. Weymar[2]

[1]Department of Psychology, University of Greifswald, Germany; [2]Department of Psychology, University of Potsdam, Germany

Response conflicts play a prominent role in the flexible adaptation of behavior as they represent context-signals that indicate the necessity for the recruitment of cognitive control. Previous studies have highlighted the functional roles of the affectively aversive and arousing quality of the conflict signal in triggering the adaptation process. To further test this potential link with arousal, participants performed a response conflict task in two separate sessions with either transcutaneous vagus nerve stimulation (tVNS), which is assumed to activate the locus coeruleus-noradrenaline (LC-NE) system, or with neutral sham stimulation. In both sessions the N2 and P3 event-related potentials (ERP) were assessed. In line with previous findings, conflict interference, the N2 and P3 amplitude were reduced after conflict. Most importantly, this adaptation to conflict was enhanced under tVNS compared to sham stimulation for conflict interference and the N2 amplitude. No effect of tVNS on the P3 component was found. These findings suggest that tVNS increases behavioral and electrophysiological markers of adaptation to conflict. Results are discussed in the context of the potentially underlying LC-NE and other neuromodulatory (e.g., GABA) systems. The present findings add important pieces to the understanding of the neurophysiological mechanisms of conflict-triggered adjustment of cognitive control.

10:40am - 11:00am

Transcutaneous vagus nerve stimulation reduces spontaneous but not induced negative thought intrusions in chronic worriers

B. Verkuil[1], W. van der Does[1], J. F. Thayer[2], J. F. Brosschot[3], A. M. Burger[1]

[1]Clinical Psychology, Leiden University, The Netherlands; [2]The Ohio State University, Columbus, OH, USA; [3]Health Psychology, Leiden University, The Netherlands

Worrying is a central symptom of anxiety disorders. It is strongly associated with low vagus nerve activity as indexed by low heart rate variability. Previous work suggests that low activity of the vagus nerve might maintain worrying, but the causal effect of vagus nerve activity on worrying has not been established. We set out to test this. Ninety-seven chronic worriers were randomly allocated to receive transcutaneous electrical stimulation of the auricular branch of the vagus nerve at the concha (tVNS), or of the earlobe (sham stimulation) while negative thought intrusions were assessed during a Breathing Focus Task, which consists of a pre-worry period, a worry induction, and a post-worry period. Participants who received tVNS reported significantly fewer negative thought intrusions during the pre-worry period, but the effects of tVNS after the worry induction were mixed. An exploratory analysis indicated that participants in the tVNS condition were more likely to report negative thought intrusions shortly after the worry induction, but became less likely to do so as the post-worry period went on. These findings provide preliminary evidence that vagus nerve activity indeed plays a causal role in the occurrence of worrisome thoughts and confirm the need for additional research on this topic.

11:00am - 11:20am

Effects of transcutaneous vagus nerve stimulation (tVNS) on selective attention and long-term memory for emotional scenes: Behavioral and neural correlates

M. Weymar[1], C. Ventura-Bort[1], J. Wirkner[2], J. Wendt[2], A. Hamm[2]

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Recent event-related potential (ERP) research indicates that non-invasive stimulation of the afferent auricular vagal nerve (tVNS) enhances the attention-related P300 component, which may be mediated by the activation of the LC-NE system. The present ERP study followed up on these findings testing whether tVNS also modulates the late positive potential (LPP), an electrophysiological index for motivated attention toward emotionally evocative cues. In addition, we tested whether tVNS increases later long-term memory for these stimuli. Using a within-subject design, 28 healthy participants (16 females) received either continuous tVNS or sham stimulation on two consecutive days (stimulation counterbalanced across participants) while performing a standard picture-viewing paradigm (30 unpleasant and 30 neutral scenes each encoding day). One week later, all pictures from both encoding days were presented along with novel scenes (120 old, 120 new) for the recognition memory task. During encoding, preliminary analysis revealed that the LPP (500-800 ms) was enhanced for unpleasant relative to neutral pictures in both stimulation conditions. Interestingly, vagal stimulation prompted earlier LPP differences (300-500 ms) between unpleasant and neutral scenes. During retrieval, we found that vagal stimulation significantly improved memory performance for unpleasant, but not neutral pictures, compared to sham stimulation. In accordance, unpleasant images encoded under tVNS compared to sham stimulation produced enhanced ERP old/new differences (500-800 ms), which reflects better recollection for these stimuli. Our results suggest that tVNS facilitates attention, learning and memory, likely via afferent projections to the arousal-modulated LC-NE system, which could also be of special relevance for clinical application.

11:20am - 11:40am

The effects of transcutaneous vagus nerve stimulation on conditioned fear extinction in humans

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Stimulating the vagus nerve has been proposed to strengthen the encoding and consolidation of memories

through the activation of the locus coeruleus-noradrenergic system. To test this hypothesis, we compared the effects of non-invasive transcutaneous vagus nerve stimulation (tVNS) to sham stimulation in a series of four fear conditioning studies. In three of these studies, participants who received tVNS displayed accelerated declarative learning rates during the extinction of conditioned fear. The consolidation of extinction memories, tested 24h after extinction learning in 2 of the studies, was not affected by tVNS. Additionally, tVNS did not affect physiological indices of fear extinction or retention in any of the studies. These results provide preliminary evidence for an effect of tVNS on declarative associative learning. The results also suggest that tVNS could potentially augment extinction-based treatments. However, additional research is needed to optimize stimulation parameters and test the clinical relevance of tVNS.

11:40am - 12:00pm

Extra presentation - it is not part of this symposium, but on a closely related topic.

Feeling in control – The affective function of autonomic processing

L. Hodossy[1], M. Tsakiris[1,2]

[1]Psychology, Royal Holloway, University of London, United Kingdom; [2]The Warburg Institute, School of Advanced Studies, University of London

Although interoception – the ability to *detect* internal bodily signals – and its relation to affective processing has been extensively studied, the control of such signals remains much less explored. Our study investigates the external parameters affecting individual's autonomic regulation and perception of cardiac signals in a biofeedback paradigm. It explores how a certain engagement level and contingency of the feedback influences *vagal control* (changes in HF-HRV) and the *detection* of cardiac signals. In the explicit biofeedback group (N=20) participants relaxed by controlling the biofeedback signal, whilst the attention-only group (N=20) engaged with the same signal without using voluntary control. Both groups performed on contingent and non-contingent trials, always preceded by the measure of baseline HF-HRV. We performed a multilevel mixed generalized linear regression analysis with gamma distribution and a square root link. We found a significant interaction between time and contingency (B = -0.47, CI = -0.90 – -0.05, p = .027) – participants' vagal control increased when they engaged with the contingent biofeedback signal, regardless of the type of biofeedback group they were in. There was a significant interaction between contingency and the type biofeedback, affecting the accuracy to distinguish between true and false feedback (B = - 13.78, CI = -23.59 – -3.98, p = .006). Participants made more identification errors during regulation in the non-contingent trials, suggesting a bias induced by agency. Together our results demonstrate that vagal control can be influenced by the contingency of external feedback which affects the detection of cardiac signals.

Session

SYMPOSIUM - Interactive brains: neural mechanisms of two-person social interaction

Time: **Friday, 20/Jul/2018: 10:00am - 12:00pm**

Location: **CZ-5**

Organizer(s): **Antonia Hamilton**

Understanding the neural and cognitive mechanisms which allow two people to coordinate their behaviour in a social context is now a critical focus for social neuroscience. This symposium presents the latest data from studies of two-person social interactions, examining how different social contexts such as being watched, being a leader or being from the same social group can modulate the neural mechanisms of imitation and interaction. We further showcase a range of methods for the study of interactive brains, including functional near-infrared spectroscopy (fNIRS), EEG, EMG, TMS and virtual reality as well as various computational methods for quantifying interpersonal processes.The first talk describes two fNIRS studies of imitation behaviour, examining why adults imitate and how they detect imitation in others, using virtual and augmented reality contexts. The second talk uses two-person EEG to examine the adoption of leader-follower roles in a coordination task. The third describes how ingroup membership changes imitation behaviour in infants and toddlers, as measured with EMG and fNIRS. The fourth describes how TMS over frontal and parietal brain regions disrupts action coordination in different social contexts using a virtual reality interface. Together, these talks illustrate how new methods allow us to test theories of the social brain and develop new models of social interaction behaviour. The symposium will finish with a discussion on future directions for social neuroscience research, as we move beyond the study of a single individual and into more interactive and socially meaningful contexts.

10:00am - 10:20am

Neural mechanisms of imitation as a social signal

A. Hamilton, A. Georgescu, S. Krishnan-Barman, P. Pinti

Institute of Cognitive Neuroscience, University College London, United Kingdom

There are many possible reasons why we imitate, including to learn from others, to forge a social connection and as a side-effect of sensorimotor contingencies. Here we focus on the hypothesis that imitation can act as a social signal, sending messages of affiliation which other can receive and act upon. We present two studies using fNIRS, motion capture and augmented reality to create scenarios were naïve participants imitate each other's actions (study 1) or are imitated by others (study 2) while neural activity in parietal cortex is monitored. In study 1, we find that participants spontaneously show high-fidelity imitation when their partner can see them, and this engages temporoparietal junction. This supports the hypothesis that people chose to imitate more when the imitative signal can be received by others. In study 2, participants who were imitated by a virtual character showed more activation of right inferior parietal cortex but less affiliation towards the virtual character. This shows that imitation is received as a social signal, but does not always lead to affiliation. We suggest that more nuanced models of the social role of imitation behaviour and the neural mechanisms underlying this behaviour would be valuable. These studies further demonstrate how innovative methods including fNIRS and augmented reality provide an ideal way to test such models.

10:20am - 10:40am

Interpersonal asymmetries: manipulating and decoding leader-follower roles from single and two-brain data

I. Konvalinka

DTU Compute, Techical University of Denmark (DTU), Denmark

Social neuroscience research has begun to depart from studies of individuals, and investigate processes *between* two people engaged in interaction. A recent trend of recording simultaneous brain activity from both people

has focused on inter-brain synchronization during symmetrical tasks. Given that most forms of social interaction are asymmetrical, with people producing complementary actions or leader-follower roles, there is a need for novel approaches to understand interpersonal asymmetries. I will present two studies that investigate this by applying machine learning to two-brain data and experimentally manipulating social asymmetry. In study 1, pairs engaged in a synchronized finger-tapping task with each other (bidirectional interaction) or with a metronome (non-interactive), whilst dual-EEG was recorded. The interactive condition was characterized by stronger alpha and beta-suppression over frontal and motor areas. Multivariate decoding was applied to two-brain data to analyze asymmetric neural mechanisms. This revealed asymmetric patterns of frontal alpha-suppression in each pair. Behavioural analyses showed that this coincided with emergence of leader-follower roles, with only leaders showing frontal alpha-suppression. Hence, spontaneous emergence of leader-follower roles could be predicted based on EEG data pooled from both members of each pair. Is this emergence of roles driven by stable traits of individuals or particular combinations of participants? To address this, I will present preliminary results from an fMRI study where the degree and asymmetry of social standing and social relationship between participants from a real-world social network are parametrically varied, to investigate the role of social standing and interpersonal bonds on behavioural and neural coordination mechanisms.

10:40am - 11:00am

Neural basis of human-avatar motor interactions embedded in different social contexts

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[1]SCNLab Department of Psychology, "Sapienza" University of Rome, Italy; [2]IRCCS, Fondazione Santa Lucia, Rome, Italy

Social contexts shape the way we interact with others and depend on both the social identity of people we are interacting with (e.g. people belonging to our same or a different social group) and by the situation characterizing the interaction (e.g. cooperative and competitive interactions). Dyadic motor interactions may require performing imitative or complementary movements and may be underpinned by frontal (mPFC) and parietal (aIPS, rTPJ) regions involved in motor planning, social control and perspective taking. In a first study, we combined non-invasive inhibitory brain stimulation with a human-avatar, cooperative or competitive, joint-grasping task where human participants coordinated their actions with a virtual partner. Inhibition of left anterior intraparietal sulcus (aIPS) impaired individuals' performance during (cooperative and competitive) complementary interactions compared to the inhibition of right temporo-parietal-junction (rTPJ), which in turn impaired individuals' performance during imitative interactions. In a second study, we explored the role of the mPFC, a brain region linked to social (e.g. racial) biases, in controlling the ability to coordinate with a virtual partner belonging to the same or different ethnicity of the participants. Inhibition of mPFC impaired individuals' motor coordination with the out-group virtual partner but left performance unchanged when interacting with in-groups. These results indicate a causal role of mPFC in controlling out-group bias during motor interactions. Taken together these results suggest that while the contribution of parietal regions during interpersonal coordination might be independent from the social context, frontal regions might exert a control role over social components during motor interactions.

11:00am - 11:20am

Selective facial mimicry of in-group members in infancy and toddlerhood

C. de Klerk[1], C. Bulgarelli[1], A. Hamilton[2], V. Southgate[3]

[1]Centre for Brain and Cognitive Development, Birkbeck College; [2]Institute of Cognitive Neuroscience, University College London; [3]Department of Psychology, University of Copenhagen

Mimicry, the spontaneous copying of others' behaviours, plays an important role in affiliation, with adults selectively mimicking in-group over out-group members. Despite infants' early sensitivity to, and preference for, in-group members, previous work suggests that it is not until 4 years of age that spontaneous mimicry is modulated by group status. Here we investigated: 1) whether selective mimicry of in-group members will be present at an earlier age if more relevant cues to group membership are used (i.e. language instead of arbitrary markers; Experiment 1), 2) whether arbitrary cues to group membership will lead to selective mimicry in younger children if we use a more sensitive measure of mimicry (i.e. EMG instead of behavioural coding; Experiment 2), and 3) the neural mechanisms underlying differential mimicry responses (Experiment 1 and 2). In Experiment 1, we found that 11-month-olds showed greater facial mimicry of native compared to foreign speakers, and that mimicry regulation was associated with activation over the left temporal parietal cortex. In Experiment 2, we found that 30-month-olds who showed a preference for an in-group model based on the colour of her t-shirt also showed more facial mimicry of that model. Data collected on the same task at 24-months, as well as simultaneously recorded fNIRS data will also be presented, allowing us to explore the development of, and neural mechanisms underlying, the selective mimicry of in-group members in toddlerhood. These findings provide the first demonstration of the modulation of facial mimicry by group status in preverbal infants and toddlers.

Extra presentation - it is not part of this symposium, but on a closely related topic.

The role of affective dimensions and face typicality in emotional face processing: An ERP study

M. R. Pereira, T. O. Paiva, F. Ferreira-Santos

Laboratory of Neuropsychophysiology, Faculty of Psychology and Education Sciences of University of Porto, Portugal

Facial processing has been a widely researched topic among the fields of psychology and neuroscience. Faces play a crucial role in social interactions, giving us information regarding the other's identity, emotional state and even allowing us to infer personal characteristics such as one's dominance or trustworthiness. Neuroimaging studies have shown that atypical faces elicit increased amygdala activation compared to typical faces. The role of typicality in the processing of facial expressions of emotion is still unexplored. Since typicality seems to modulate the perception of face valence and social features, it is important to understand how typicality affects the neural and subjective processing of emotional expressions. In this study, we expected atypical faces to lead to increased N170 amplitudes and also, based on previous findings by our group, an effect of affective arousal, regardless of the emotional category. To this purpose, we presented typical and atypical facial identities displaying high and low arousal expressions of Anger and Happiness, and pleasant and unpleasant expressions of Calm and Surprise (this manipulation allows an orthogonal comparison of emotional categories, arousal and valence). We found an effect of arousal on the N170, independently of typicality, emotional categories or valence. This evidence goes against our hypothesis of a cumulative effect of atypicality and affective arousal. We will discuss the limitations of the concept of face typicality in the field of emotional expressions.

POSTER SESSION I

Time: *Location:* **Boerhaaveplein**
Friday, 20/Jul/2018:
12:00pm - 1:30pm

P1-01 A comparison of effects of pharmacological and neurofeedback interventions for ADHD on behavioural and neurophysiological inhibitory control parameters

A. Bluschke, V. Roessner, C. Beste
Kognitive Neurophysiologie, Technische Universität Dresden, Germany

In the treatment of attention deficit/hyperactivity disorder (ADHD), the use of methylphenidate (MPH) is very effective. Theta/Beta neurofeedback (NF) is becoming an increasingly popular approach. Apart from on the symptom level, however, the precise effect profiles of these interventions on the neurocognitive level have not yet been directly compared. Children with ADHD who were either treated with MPH (n=20) or eight weeks of Theta/Beta NF (n=23) performed a standard GoNogo task before the onset of the intervention and eight weeks after. In addition to event-related potential (ERP) techniques and source localization (sLORETA), residue iteration decomposition (RIDE) was also used to account for the high intra-individual variability. A waiting list control group (n=18) was included to control for possible unspecific effects. Treatment with MPH and NF resulted in significant and very similar improvements in the ability to inhibit responses in Nogo trials. On the neurophysiological level, treatment with MPH resulted in increased central Nogo-P3 amplitudes. A similar increase across all trial types was observed later and more posteriorly in case of NF. These effects were only visible after accounting for neuronal variability using RIDE. sLORETA showed different sources of the effects in the two groups. No effects were found in the waiting list controls. The study demonstrates differences in neuronal mechanisms related to different treatment strategies for ADHD. Although behavioural effects were comparable, the two examined intervention approaches for ADHD are associated with different underlying neurophysiological mechanisms that only become apparent once intra-individual variance is accounted for.

P1-02 Favored unpleasantness perception in depressed patients: A multilevel study

L. De Zorzi, J. Honoré, M.-S. Robin, H. Sequeira
SCALab, CNRS UMR 9193, University of Lille, France.

Major Depressive Disorder (MDD) is associated with emotional and attentional deficits over the visual field. This leads to behavioral, cognitive and physiological manifestations, explored in this study by comparing the impact of emotional pictures presented in central and peripheral vision (CV, PV) in patients with MDD and healthy controls. Fifteen patients and 15 matched controls were presented with two sets of 175 pictures (unpleasant and neutral) from the International Affective Picture System, at five eccentricities (-24°; -12°; 0°; +12°; +24°). The participants had to categorize the pictures according to their emotional value. We analyzed behavioral (reaction time, accuracy and efficiency, i.e. a speed-accuracy composite score) and bodily (cardiac and electrodermal responses) markers. The cerebral dynamics was also assessed with a spatiotemporal principal component analysis (PCA). Patients showed difficulties to categorize neutral pictures, an effect that diminished with eccentricity. While the patients showed greater electrodermal responses to unpleasant than to neutral stimuli in CV, the cardiac deceleration was greater for unpleasant than neutral stimuli in controls but not in patients whatever the eccentricity. Moreover, the effect of emotion on behavioral efficiency correlated with depression and anxiety scores, as well as with its effect on a 230-ms left frontotemporal component. In conclusion, though they appeared to be more aroused by unpleasant pictures when presented in CV, the patients seemed to be similarly oriented by unpleasant and neutral pictures and less efficient to treat neutral ones. Our data sustain the idea that depression restricts the attention field and favors negative perceptions.

P1-03 Neural network changes in posttraumatic stress disorder: From diffusion tensor imaging to graph analysis

S. J. Siehl[1,2,3], M. Wicking[1], S. Pohlack[1], T. Winkelmann[1], F. Zidda[1], F. Steiger-White[1], J. King[3,4], N. Burgess[3,5], F. Nees[1], H. Flor[1]
[1]Department of Cognitive and Clinical Neuroscience, Central Institute of Mental Health, Medical Faculty Mannheim, Ruprecht-Karls-University Heidelberg, Mannheim, Germany;; [2]Graduate School of Economic and Social Sciences, University of Mannheim, Mannheim, Germany;; [3]UCL Institute of Cognitive Neuroscience, University College London, London, United Kingdom;; [4]Clinical, Education and Health Psychology, University College London, London, United Kingdom;; [5]UCL Institute of Neurology, University College London, London, United Kingdom

The human brain is a large interconnected network of functionally distinct regions connected via white matter tracts. Graph theory provides valuable, network specific metrics and in addition integrates functional and structural measurements. Some brain regions are more densely interconnected among themselves than others, a phenomenon coined as “rich clubs”. In recent years, rich clubs were reported to play a central role in the development of mental disorders, such as Posttraumatic Stress Disorder (PTSD). To further investigate neural network changes in PTSD, we included structural white (DTI) and grey matter (VBM) as well as functional resting state (fMRI) data into a common network using the CONN- and Brain Connectivity Toolbox. The sample of our study comprises over 150 adult participants, including 45 patients suffering from PTSD, 50 healthy trauma control subjects (TC) and 60 healthy subjects without any traumatic life experience (HC). In our preliminary results, we find changes in the *salience network* between patients and both control groups, with a decrease in the clustering coefficient as well as the degree and an increase in the average path length. In the lateral *visual network* including bilateral hippocampi, we find an increase in global efficiency, cost and degree between patients with PTSD in comparison to HCs only. These are central measurements of the centrality, functional segregation and integration of neural cognitive networks and point towards changes in the global efficiency of rich clubs between patients and control subjects and neuroplastic changes on network level due to traumatization. Supported by the Deutsche Forschungsgemeinschaft (SFB636/C01)

P1-04 The link between self-assessed emotional and intelectual states levels and real performance in cognitive tasks among patients with depression.

A. Kroll, E. Dańczura
Department of Psychiatry, Independent Clinical Psychology Unit, Pomeranian Medical University, Poland

Our study focuses on the question how the patients' with depression general condition self-assessment is associated with their real performance in cognitive tasks. There were 10 participants, patients all diagnosed with

depression according to Hamilton Depression Rating Scale (HDRS), who took part in two diagnostic sessions: at the beginning of therapy and after four weeks of treatment. During each session, they assessed their current physical, psychical and intellectual condition in a survey. They also accomplished two psychological tests (TMT, TUS) as well as took part in three experimental visual cognitive tasks. Eye-tracking data were collected as well. The second examination session showed that the average level of depression symptoms in HDRS (M=15.3, SD=5.54) was significantly lower from the first one (M=24.8, SD=7.24), (t=4.828, p<.001, Cohen's d=1.527). In comparison to the initial self-examination, participants reported improvement in intellectual (t=-3.115, p<.006, d=-0.985) as well as psychical (t=-2.862, p<.009, d=-.905) conditions in the second session. TMT A (t=2.850, p<.019, d=.901) and TMT B (t=2.413, p<.039,d=0.763) parts results were also significantly better in the second examination. The experimental tasks showed significant improvement as well. Our findings can be interpreted in the view of the theories which claim human attention to be a result of two competing mechanisms: exogenous and endogenous (Egeth and Yantis, 1997). Depression's mostly negative emotional state can be seen as a distracting factor which itself grabs one's attention and lowers ability to focus. When the overall psychical state is improving, it frees cognitive resources and enables better performing in cognitive tasks.

P1-05 The impact of genetic versus environmental factors on human neurocognition and affect, and neurobehaviors from twin study in Human Connectome Project (HCP)

S. Eom[1], B. Joo[2], Y. Lee[3], B. Park[4]

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The HCP (Human Connectome Projects) is a large-scale international collaboration aimed at elucidating the genetic and environmental sources of normal variability within the human neurobehaviors and brain. The current study aimed to investigate the impact of genetic versus environmental factors on human function, including neurocognition, affect, personality and psychological well-being; we hypothesized that those values are associated with general adaptive function from the behavior data providing in HCP. The HCP collects imaging, behavioral, and demographic data from a large population of young and healthy adults. Here we analyzed neurocognitive, affect, and neurobehavioral index from 278 (97 monozygotic twins, 84 non-twin siblings) subjects (22 to 36 years of mean age). No significant differences of neurocognitive function index were shown including attention, memory, language, and executive function. However, we found significant differences regarding some emotion recognitions, negative affect and personality including happiness identification, anger-hostility and neuroticism ($p < 0.01$). Moreover, the genetic factors remarkably appeared to be influential on most of neurobehaviors including internalizing and externalizing behaviors ($p < 0.01$). Our findings suggest an interesting contrast whereby some affect and neurobehaviors seemed to be mostly influenced by the genetic factors while others represented higher trend of nurture effect such as parenting or environment. Better understanding of the influence of nature versus nurture on neurobehaviors could be helpful for developing the most suitable guideline to the therapeutic intervention for higher adaptive function and quality of life.

P1-06 Feasibility of visual-motor training in pediatric brain tumor survivors

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Tumors arising in the brain's posterior fossa are the most common type of pediatric brain tumors. Methods of treatment have provided substantial increase in patients' survival rates. Nevertheless, the impairment of cognitive and motor functions often occurs. The most frequently observed deficits in posterior fossa tumor (PFT) survivors include motor skills decrease due to the cerebellum pathology involvement. The aim of the trial was to evaluate the state of visual processing, motor coordination and visual-motor integration in PFT survivors before and after visual-motor training. The cohort included 51 PFT survivors (24 females, 27 males, mean age was 12.02±3,24). We used Berry VMI for assessing visual-motor integration, motor coordination and visual perception. The participants completed VMI test. After that, they were divided into two groups of equal sex, age and diagnosis. Then one of the group performed 2-week training consisted of 6 sessions using training devices for visual-motor integration and executive functions enhancement. The other group didn't receive any intervention. After two weeks, VMI test was carried out once again; then two groups were changed over: the second one received training and the first one did not. The assessment of visual-motor functions was conducted once again. The findings reveal that visual-motor integration and motor coordination became significantly better after the training than it had been before it. The measures fixated by training devices were also increasing during the training. Thus, the training of visual-motor integration and executive functions has confirmed its effectiveness in pediatric brain tumor survivors.

P1-07 Anxiety and neurodegenerative loss of amygdala inhibition in patients with mild cognitive impairment

Y. Blake[1], D. Terburg[2], E. Walsh[3], A. Donati[3], A. Von Gunten[3], J. van Honk[2], R. Stoop[1]

[1]Centre for Psychiatric Neuroscience, University of Lausanne, Switzerland; [2]Department of Experimental Psychology, Utrecht University, The Netherlands, Department of Psychiatry and Mental Health, University of Cape Town, South Africa; [3]University Service of Psychiatry for the Elderly, University Hospital Centre of Vaud (CHUV), Switzerland

This project examines anxiety symptoms in patients with Mild Cognitive Impairment (MCI), a frequent precursor of Alzheimer's disease (AD). Emotional symptoms, including anxiety, are frequently observed in MCI and AD patients and can be highly distressing for patients and caregivers (e.g. Nowrangi et al., 2015; Ismail et al. 2017). We consider the role of the basolateral and central amygdala (BLA and CeA) in these symptoms. The amygdala is critically involved in anxiety, and atrophy of the BLA is common early in MCI and AD (e.g. Miller et al., 2013; Younes et al., 2014), while recent evidence suggests that the CeA remains relatively intact (Miller et al., 2012; Miller et al., 2015). The CeA is important for the unconditioned, instinctive fear response, whereas the BLA can exert modulatory control over CeA activity. Patients with bilateral, circumscribed BLA lesions show hyper-anxiety, likely arising from a loss of inhibitory control of the BLA over the CeA (Terburg et al., 2012; Terburg, Scheggia et al., in press). Anxiety symptoms in MCI patients may similarly be related to a loss of CeA inhibition. I run a number of tasks to test participants' sensitivity to anxiety-related

stimuli, their ability to inhibit this anxiety and the interplay between emotion and episodic memory. Results reveal differences between MCI patients and controls, as well as between those MCI patients who experience symptoms of anxiety and those who do not. Work is currently ongoing to examine whether these behavioural differences are related to differences in deterioration of amygdala sub-regions.

P1-08 Memory, sleep, and the relationship between sleep disorders and memory impairment

P. Pedic

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Sleep can be defined as a natural, reversible state of reduced responsiveness to external stimuli that occurs at regular intervals and is homeostatically regulated. It can be divided into two different stages: rapid eye movement sleep (REM) and non-rapid eye movement sleep (nonREM). Each is linked to specific brain waves pattern and neural activity. Moreover, nonREM sleep can be subdivided into 3 successive sub-stages, with stage 1 as the lightest sleep and stage 3 as the deepest. There are many functions associated with sleep, including those that lead to the restoration of body, brain, and neurocognition. One of the neurocognitive functions associated with sleep is memory consolidation. Like sleep, memory processing is also divided into different stages: the initial being encoding, which allows the new item to be converted into mental representation inside the brain, followed by consolidation - the process of stabilizing a memory trace over time. The third stage is retrieval, the ability to take new information out of storage. It is believed that hippocampal activity specifically supports memory consolidation during sleep, through specific coordinate neurophysiological events that facilitate the integration of new information into pre- existing cortical networks. The question then arises: if sleep really does participate in memory consolidation - one of the key phases in making a new memory, what happens to memory if sleep is distorted? The primary objective of this article is to give a short overview of sleep, memory and the relationship between some of the most common sleep disorders, such as insomnia, apnea, narcolepsy, and memory.

P1-09 A brief mindfulness-based intervention enhances psychological measures of wellbeing

G. L. de Lima Araujo[1,2], T. M. Almeida Silveira Mendes[1], M. M. Piva Demarzo[3], N. Farb[2], M. B. Cordeiro de Sousa[1]

[1]Brain Institute, Federal University of Rio Grande do Norte, Brazil; [2]Department of Psychology, Univeristy of Toronto-Mississauga, Canada; [3]Federal University of São Paulo, Brazil

Over the past decades, a growing body of research has targeted how interoception, the felt sense of the body, informs appraisals of subjective well-being. Mindfulness training (MT) describes a collection of attention practices aimed at cultivating such awareness, in an effort to renegotiate maladaptive self-referential tendencies. Here we report on a brief MT intervention relative to a randomized control condition, investigating the mechanisms by which MT mitigates the response to a well-validated stress reactivity paradigm in 40 participants. The MT group performed a 30 minute breath-focused mindfulness practice at 3 consecutive days in a laboratory environment. The control group performed a coloring activity for 30 minutes, also for 3 consecutive days in the laboratory. Based on Wilcoxon signed-rank tests, our results show consistent within-group improvements in the MT but not control groups in measures of interoception (Mindfulness: V= 23, p=0.004; Control: V= 88, p= 0.793); State Mindfulness (Mindfulness: V=32, p=0.006, Control: V= 135.5, p = 0.262); and Anxiety (Mindfulness: V=148, p=0.03; Control: V=115, p=0.72). Our data also shows a difference in between groups regarding to interoception (W= 112.5, p=0.01) and state of mindfulness (W=92, p=0.003). Both measures present higher scores after MT. According to these results, even a brief MT intervention can significantly lower scores related to anxiety and can enhance interoception and mindfulness, corroborating similar results obtained from studies that use traditional interventions such as the 8-week Mindfulness-Based Stress Reduction Program.

P1-10 Exploring individual differences in everyday pro-environmental behaviour - A neural trait approach

B. P. Langenbach, T. Baumgartner, L. Gianotti, D. Knoch

Department of Social Psychology and Social Neuroscience, Institute of Psychology, University of Bern, Switzerland

Humankind faces a vast number of environmental problems, many of which are aggravated by the behaviour of individual human beings. To better understand interindividual variance in pro-environmental behaviour and to ultimately encourage it, we tried to identify individual markers that explain variance in day-to-day pro-environmental behaviour. In this study, we applied the neural trait approach to assess stable and objective individual differences. Using electroencephalography, we measured cortical activity at rest and combined our neural, task-independent data with an ecologically valid assessment of day-to-day pro-environmental behaviour. We found that task-independent baseline cortical activity in the right lateral prefrontal cortex, a brain area known to be involved in cognitive control and self-control processes, explains individual differences in everyday pro-environmental behaviour. This lends support to the assumption that cognitive control and self-control are essential for green behaviour.

P1-11 Keep track: Age-related differences in pro-active driving behavior revealed by EEG measures

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Healthy aging is usually associated with a decline in cognitive functions, which can become an issue when complex tasks have to be performed like driving a car in a demanding traffic situation. On the other hand, elderly are able to compensate age-related declines in cognitive functioning by extra mental effort and other compensatory strategies. The present study investigated the interplay of age, workload, and mental effort using EEG measures and a proactive driving task, in which 16 younger and 16 older participants had to keep a virtual car on track of a curvy road. Total oscillatory power and relative power in Theta and Alpha bands were analyzed, as well as event-related potentials to task-irrelevant regular and irregular sound stimuli. Steering variability and Theta power increased with increasing task load (i.e., with shaper bends), while Alpha power decreased. This pattern of workload and mental effort was found in both age groups. However, only in the older group a relationship between steering variability and Theta power occurred, in which better steering performance was associated with higher Theta power, reflecting higher mental effort. In the younger group, lower steering variability came along with lower ERP responses to deviant sound stimuli, reflecting reduced processing of task-irrelevant environmental stimuli. Thus, better performance (i.e., more alert steering behavior) in the proactive driving task was associated with increased mental effort in the older group, and a higher attentional focusing on the task in the younger group, indicating age-specific strategies in managing demanding (driving) tasks.

P1-12 Acquisition of orthographic representations in deaf readers

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Skilled reading relies on fast and easy access to the orthographic lexicon. According to the self-teaching hypothesis (Share, 1995), phonological recoding is the prerequisite of the establishment of these orthographic representations. Testing deaf readers enables us to study visual word recognition without automatic phonological recoding; thus, the results can elucidate on whether recoding between the visual and auditory modality is necessary for orthographic learning. To track the acquisition of written word forms, we used masked form priming as an index of orthographic learning. Priming effects depend on the lexical status of the prime: pseudoword primes facilitate, word primes inhibit the recognition of orthographically similar target words. Thus, as pseudowords become lexicalized words, inhibition should emerge. In our study, hearing and deaf participants were presented with word and pseudoword primes and one-letter different (orthographic neighbor) target words in a masked lexical decision task. In the subsequent orthographic learning task, they were trained to read half of the pseudoword primes in a picture-word matching task. Finally, participants repeated the masked lexical decision task. Training resulted in slower responses for targets preceded by trained primes compared to untrained primes suggesting increasing integration of the novel word form into the orthographic lexicon. Deaf participants showed similar pattern of orthographic learning as hearing participants, which suggests that phonological recoding is not necessary to establish orthographic representations. Relationship between orthographic learning and individual differences in spelling and reading fluency is also discussed.

P1-13 Effectiveness of TGFU in students' physical education performance through promoting metacognitive knowledge and metacognitive regulation

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This study investigated the effectiveness of Teaching Games for Understanding (TGfU) method, compared to traditional technique-focused teaching method, in psychical education basketball classes, and whether a such effectiveness is related to positive impact of TGfU on metacognitive knowledge (declarative, procedural, conditional) and metacognitive regulation (planning, monitoring, problem solving strategies, information management, imagery, evaluation). The participants were forty-one, 7th grade, students, who were randomly assigned to a control group (10 boys, 11 girls), which was taught by a technical approach, and an experimental group (8 boys, 12 girls), which was taught by TGfU. Duration of the intervention was 10 weeks (twice a week for 45 minutes) in physical education classes. Each lesson consisted of steps: activity appreciation, tactical awareness, decision-making, application of skills (identification and practice skills) and performance (putting it all together, applying the skills, decision-making and tactics in game situations). In pre- and post- intervention conditions were estimated: game performance in 5-5 basketball by coding players' behavior, game skills, such as basket shot, basic movement, push pass for accuracy and dribbling, and metacognition (both metacognitive knowledge and metacognitive regulation) through a specific metacognition questionnaire in physical education. The results showed that, after the intervention, the experimental than the control group of students, achieved greater basketball game performance, metacognitive knowledge and metacognitive regulation, while there were no differences between the two groups in the pre- intervention condition. Also, after the completion of the program, both groups demonstrated greater basketball performance and metacognition (not all components), in favoring the experimental group.

P1-14 Morning brain: Evidence from EEG and learning outcomes that high school class times matter

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Researchers, parents, and educators consistently observe a stark mismatch in adolescents between biologically preferred sleep-wake hours and socially imposed sleep-wake hours. As a result, there is an ongoing public debate about high school start times. To contribute neural evidence to this debate, we examined changes in high schoolers' brain activity throughout the school day. We collected electroencephalogram (EEG) data from 22 high school seniors at two different New York City schools during their regular classes. Classes were taught at three different times of day: early morning (8:30am), mid-morning (10:30am), and afternoon (2:30pm; 17 recording days total). Class materials were presented using different class activities (videos and lectures), and students completed a multiple-choice quiz after each class to measure their retention of that lesson's content. Our analysis focused on power changes in the alpha frequency band (~ 7-14 Hz), a well-known correlate of attentional state, where higher alpha is typically linked to lower focus. Students' baseline alpha power decreased as the time of day progressed, consistent with adolescents being least attentive early in the morning. Similarly, quiz scores were higher for materials learned in mid-morning classes than early-morning classes. While students showed consistently worse performance and higher alpha in the early morning classes, quiz scores and alpha activity in the afternoon varied by individual focus as well as class activity. Together, our findings demonstrate that class time is reflected in adolescents' brain responsivity and suggest that mid-morning may be the best time to learn.

P1-15 The relationships between measures of cognitive functioning among primary school age children with and without intellectual disabilities

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The current study focuses on the analysis of the relationship between information processing speed, working memory and non-verbal intelligence in primary school age children with and without intellectual disabilities. The sample includes 50 primary school age children with mild intellectual disabilities (age range: 7.5 – 11.5 years; 68% boys) and 50 primary school age children without intellectual disabilities matched by gender, date of birth and place of residence. Processing speed and working memory were measured using the computerized tasks 'Choice Reaction Time' and 'Corsi Tapping Block', respectively. Non-verbal intelligence was measured using

Raven's Progressive Matrices. First, the data were analyzed in terms of norms and distributions for each cognitive measure in groups of children with and without mild intellectual disabilities. Second, we conducted a series of ANOVAs to look at differences in typical and atypical child development on each of the analyzed measures of cognitive functioning. Third, we investigated whether any differences exist in relationships between cognitive measures in children with and without mild intellectual disabilities. We found differences between the two groups of children for all analyzed cognitive measures: with the biggest effect size for non-verbal intelligence (?2= 0.22; p < 0.001) and the smallest one for working memory (?2= 0.02; p< 0.01). The correlation between processing speed and non-verbal intelligence was stronger in children with mild intellectual disabilities than in children with typical development (r = -0.56 vs. r = -0.25). There were no other differences in the associations among speed processing, working memory and non-verbal intelligence.

P1-16 Subsequent memory effect associated with semantic encoding in mild cognitive impairment: An ERP study

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This study examines subsequent memory effect (SME) associated with semantic encoding in mild cognitive impairment (MCI) using the event-related potential technique (ERP). SME is an index of successful memory encoding. Typically, SMEs are positive at P550 and late positive component (LPC) time windows. SME has been identified occasionally at P2 or N250-400 intervals. Ten MCI participants were recruited and completed the experiment. A study and recognition paradigm was adopted. Participants determined whether the items referred to by the Chinese characters on a computer screen were able to produce sound at study phase and whether the characters displayed have just been studied at recognition phase. Their electroencephalograms were recorded while performing these tasks. Behaviourally, correct percentage at study was 81% and reaction time was 998.5±325.5. Correct percentage at recognition was 61% (d prime = 0.87±0.7). Significant SMEs were not identified in P2, P550 and LPC. Significant effect in the midline (F(1, 9)=5.221, p=0.048) around N250-400 was identified. Behavioural and ERP results indicated possible extensive cognitive deficits in MCI when performing semantic encoding. Though there was some evidence of ability to access semantic memory, this did not benefit their memory performance because of deficits in working memory updates as well as binding memory representations with long-term memory store.

P1-17 Evidence for a neural dual-process account for adverse effects of cognitive control

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Advantageous effects of cognitive control are well-known, but cognitive control may also have adverse effects, for example when it suppresses the implicit processing of stimulus –response (S-R) bindings that could benefit task performance. Yet, the neurophysiological and functional neuroanatomical structures associated with adverse effects of cognitive control are poorly understood. We used an extreme group approach to compare individuals who exhibit adverse effects of cognitive control to individuals who do not by combining event-related potentials (ERPs), source localization, time-frequency analysis and network analysis methods. While neurophysiological correlates of cognitive control (i.e. N2, N450, theta power and theta-mediated neuronal network efficiency) and task set updating (P3) both reflect control demands and implicit information processing, differences in the degree of adverse cognitive control effects are associated with two independent neural mechanisms: Individuals, who show adverse behavioral effects of cognitive control, show reduced small-world properties and thus reduced efficiency in theta-modulated networks when they fail to effectively process implicit information. In contrast to this, individuals who do not display adverse control effects show enhanced task set updating mechanism when effectively processing implicit information, which is reflected by the P3 ERP component and associated with the temporo-parietal junction (TPJ, BA 40) and medial frontal gyrus (MFG; BA 8). These findings suggest that implicit S-R contingencies, which benefit response selection without cognitive control, are always 'picked up', but fail to be integrated with task representations to guide response selection. This provides evidence for a neurophysiological and functional neuroanatomical "dual-process" account of adverse cognitive control effects.

P1-18 How non-veridical sensory dimensions shape action

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Although perception-action interactions have been studied for centuries, existing knowledge about the connections between healthy human perception and action is exclusively derived from studying the effects of perceptual dimensions that are ubiquitously agreed to be objectively present in the 'real' world (i.e. are *veridical*). So far, it is still unclear how actions are modulated by non-pathological, idiosyncratically-enriched stimulus dimensions lacking perceptual veridicality i.e. perceptual dimensions without real-world perceptual presence. Prominent theories about the links between action and perception, such as the Theory of Event Coding (TEC), (Hommel, 2009) suggest that associations related to a percept or stimulus can automatically be bound to a response even if its presence is neither necessary, nor useful for a certain goal or action. By using grapheme-colour synaesthesia as a model condition, we show how non-pathological perceptual dimensions that are not objectively present (i.e. are *non-veridical*) and that are irrelevant for an action nevertheless modulate the higher-order cognitive control. Synaesthesia is a perceptual phenomenon (distinct from psychopathology) in which single letters and words (i.e. inducer) consistently and automatically trigger an involuntary experience of colour (i.e. concurrent) that lacks perceptual presence despite being perceptually vivid. Our results show that non-veridical sensory dimensions lacking perceptual presence nonetheless strongly affect actions and inhibitory control and particularly, impulsive behaviour. They do so by modulating response selection and stimulus-response binding processes in medial frontal cortices and specifically the anterior cingulate cortex (ACC), which is in close alignment with theoretical propositions such as the TEC.

P1-19 Specific properties of the SI and SII somatosensory areas and their effects on motor control: a system neurophysiological study

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Sensorimotor integration is essential for successful motor control and the somatosensory modality has strong effects on the execution of motor plans. The primary (SI) and the secondary somatosensory (SII) cortices are known to differ in their neuroanatomical connections to prefrontal areas, as well as in their involvement to encode cognitive aspects of tactile processing. We ask whether the area-specific processing architecture or the structural neuroanatomical connections with prefrontal areas determine the efficacy of sensorimotor integration processes for motor control. In a system neurophysiological study including EEG signal decomposition (i.e., residue iteration decomposition, RIDE) and source localization, we investigated this question using vibrotactile stimuli optimized for SI or SII processing. The behavioral data show that when being triggered via the SI area, inhibitory control of motor processes is stronger as when being triggered via the SII area. On a neurophysiological level, these effects were reflected in the C-cluster as a result of a temporal decomposition of EEG data, indicating that the sensory processes affecting motor inhibition modulate the response selection level. These modulations were associated with a stronger activation of the right inferior frontal gyrus extending to the right middle frontal gyrus as parts of a network known to be involved in inhibitory motor control when response inhibition is triggered over SI. In addition, areas important for sensorimotor integration like the postcentral gyrus and superior parietal cortex showed activation differences. The data suggest that connection patterns are more important for sensorimotor integration and control than the more restricted area-specific processing architecture.

P1-20 Alcohol intake impairs intentional but not stimulus-driven inhibition

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Theoretically, motor inhibition could be classified into stimulus-driven inhibition and intentional inhibition based on the degree of endogenous volition involved. Intentional inhibition refers to the ability to voluntarily suspend or inhibit prepared actions without external stop signals. Up to now, research on the effects of alcohol use on response inhibition focused exclusively on stimulus-driven inhibition. In the current study we investigated the effect of intoxication on these two forms of response inhibition in a double-blind, between-subject design. A modified-stop signal task and a newly developed chasing bottle task was administered for measuring stimulus-driven inhibition and intentional inhibition. One hundred and eleven participants were recruited and randomly assigned into one of the three groups; Alcohol, Placebo or Control. It turned out males stopped faster to external stop signals than females on the stop signal task. However, alcohol intake did not impair stimulus-driven inhibition. On the other hand, alcohol intake did have an effect on intentional inhibition. After alcohol intake people were less likely to engage voluntary inhibitory control. They were more likely to continue tracking alcohol and beverage bottles compared with the Placebo and Control groups. This means stimulus-driven inhibition and intentional inhibition reflected different aspects of inhibition and showed different response to alcohol intake.

P1-21 Does gaze direction modify the age-related differences in Simon-effect?

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In a modified version of the Simon task we investigated the age-related differences in inhibitory control and the long-lasting effects of these differences. 24 young (18-27 years) and 22 older (63-74 years) adults participated in the experiment in which a distracting face stimulus gazed at the direction of the target stimulus or the opposite site before they would have been presented. Participants had to press the right/left button when letter J/B was presented. The side of the stimulus and the response could be congruent (CS) or incongruent (ICS). Older adults showed a larger Simon-effect in reaction time and target-locked P3 amplitude than young adults. The response-locked lateralized readiness potential (LRP) was larger and had an earlier onset in the older group, and larger amplitude was found in the ICS compared to the CS condition. Although we hypothesized that an important social cue, like the gaze direction would influence spatial visual attention, it did not have a significant effect on the parameters we investigated. We also hypothesized that decreased inhibitory control results in greater processing of unattended face stimulus. Face-locked N170 component had longer latency and larger amplitude in older adults compared to young people showing that older participants processed the irrelevant stimuli longer and to a greater extent, however, in a later old/new task they could not benefit from this investment: young adults recognised more faces than older adults. In conclusion, older adults showed decreased inhibitory control, but they could not take advantage of the processing of irrelevant stimuli.

P1-22 Control yourself: testing the relationship between cognitive control and prosociality

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The question of whether humans are fundamentally good or evil has plagued philosophers for millennia. Recently this question has been operationalized in psychological research as a question of whether individuals innately tend towards behaviors that benefit others (prosocial tendencies) or behaviors that benefit themselves (proself tendencies). Intuitively, this question suggests a link between social preferences and cognitive control, however results examining this relationship have been inconsistent. Some research supports the idea of an intuitive prosociality - where individuals must exert control to choose more strategically and selfishly - while others support the theory of inherent selfishness - where individuals must exert control to overcome self-serving tendencies and abide by social fairness norms. This study expands on this line of thinking by disentangling the Social Value Orientation (SVO) into two independent dimensions: a weight placed on self-outcome (Ws) and a weight placed on others' outcomes (Wo). Using this measure of social preference along with a Stroop task (a well validated measure of cognitive control) performed inside an fMRI scanner, in the current study we are well poised to elucidate how this personality trait is reflected in an individual's neural organization, and how it relates to cognitive control at both a behavioral and a neural level. We are currently examining whether an individual's Ws or Wo is indicative of success during the Stroop task. As a

next step, we will analyze whether neural activity during this cognitive control task predicts performance. If so, is this neural activity mediated by an individual's SVO?

P1-23 Exploring the effect of microdosing psychedelics on creativity

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Recently popular sub-perceptual doses of psychedelic substances such as truffles, referred to as "microdosing", allegedly have multiple beneficial effects including creativity and problem solving performance, potentially through targeting serotonergic 5-HT_{2A} receptors and promoting cognitive flexibility, crucial to creative thinking. Nevertheless, enhancing effects of microdosing remain anecdotal, and with absence of quantitative research on microdosing psychedelics, it is impossible to draw definitive conclusions on the matter. Here, our main aim was to quantitatively explore the cognitive-enhancing potential of microdosing psychedelics in healthy adults. During a microdosing event organized by the Dutch Psychedelic Society, we examined the effects of psychedelic truffles on two creativity-related problem-solving tasks: the Picture Concept Task assessing convergent thinking, and the Alternative Uses Task assessing divergent thinking. A short version of the Raven's Progressive Matrices task assessed potential changes in fluid intelligence. We tested once before taking a microdose and once while the effects were manifested. We found that both convergent and divergent thinking performance was improved after a non-blinded microdose, whereas fluid intelligence was unaffected. Based on these preliminary results we propose that psychedelics might affect cognitive metacontrol policies by optimizing the balance between cognitive persistence and flexibility.

P1-24 Methamphetamine-induced difficulties in cognitive control allocation may normalize after prolonged abstinence

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Chronic heavy methamphetamine abuse likely causes dopaminergic neurotoxicity, which is commonly thought to result in cognitive control deficits. Both of these alterations may persist even after the abuse is discontinued, but tend to (partly) improve with increasing duration of abstinence. While several studies have demonstrated that the reinstatement of comparatively normal dopaminergic signaling may take months, if not years, the amelioration of cognitive deficits has predominantly been investigated in much shorter intervals of several weeks to less than half a year. Against this background, we set out to investigate the effects on prolonged abstinence in n=27 abstinent former methamphetamine abusers in a cross-sectional design using behavioral and neurophysiological measures of cognitive control. Our behavioral results suggest that former abusers struggled to identify and adapt to different degrees of cognitive control requirements, which made their behavioral performance less expedient than that of healthy controls. On the neurophysiological level, this was reflected by reduced modulations of the N2-N450 amplitude in response to high vs. low cognitive control requirements. Yet, those effects could only be observed in methamphetamine abusers who had been abstinent for a relatively short time (mean 9.9; max. 18 months), but not in former abusers who had been abstinent two years or longer. While this finding alone does not allow for causal inferences, it suggests that the amelioration of control deficits may take longer than what is commonly investigated (1-6 months). Hence, some of the statements about permanent/irreversible dopamine-dependent executive dysfunctions in former methamphetamine abusers should be interpreted with caution.

P1-25 Motivation, but not training setting, impacts training-induced improvements in executive control in healthy older adults

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Enhancing cognitive capacities by cognitive training becomes of paramount importance when it concerns older adults. Healthy aging brings structural and functional brain changes that normally relate to impairments in cognitive control functions. Hence, developing interventions to enhance, or at least maintain, executive functioning in older adults is of special importance, as also is the identification of factors that can modulate training-related improvement. In this context, the goal of this work was to explore the impact of two factors on older adults' performance after training: training setting and motivation along the intervention. 44 healthy older adults were trained during six 1-h sessions with two different adaptive process-based programs. One group underwent executive-control training (updating, interference control and switching) and the other served as an active control and only trained processing speed. In both training conditions, half of the sample performed the training tasks in the laboratory and the other half did training at home. Motivation was measured by self-reported questionnaires every training session and after completing the intervention. Our results reveal that the magnitude of training improvement was independent of training setting and that participants in both locations were similarly motivated. Furthermore, only for the executive-control training group motivation had a positive influence and reaching higher levels of performance was positively related to higher motivation scores. Considering these factors in the design of interventions for older adults becomes essential in order to promote greater training improvements, as well as consequent transfer effects during healthy aging.

P1-26 The effect of dual-task priming on convergent and divergent thinking

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There is growing evidence that cognitive control states can vary both between and within people and that they can be systematically controlled to promote either a more persistent or a more flexible cognitive control state. Engaging in a convergent- or divergent-thinking task differentially affects subsequent dual-task performance as a consequence of the specific metacontrol state (persistent vs. flexible) induced by the prime task. The current study attempted to investigate whether current metacontrol states can be systematically biased by means of tasks that call either for persistence or flexibility. In a two-session within-subjects design, participants performed a dual-task to prime a persistent (long SOAs) vs. a flexible (short SOAs) processing style, interleaved with a convergent and a divergent creativity task. While the PRP effect remained intact, we found that the backward compatibility effect disappeared upon splitting the SOAs as we did, hence the manipulation was not suited as a persistence/flexibility prime. The convergent

thinking task showed an effect opposite to what we predicted (i.e. higher accuracy following short SOAs), and the divergent thinking task showed a tendency in the opposite direction as well.

P1-27 MPH reduces response conflicts only in case of high task automatization

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There is mounting evidence that volitional cognitive control and automaticity are not independent or opposing processes, but interact. Yet still, not much is known about the neuropsychopharmacological basis of this interaction. While the dopaminergic system has been demonstrated to heavily modulate volitional cognitive control mechanisms, its role for the interaction of automatic and controlled processes has remained rather elusive. To investigate this, we administered methylphenidate (MPH; 0.5 mg/kg body weight) to n=23 healthy young subjects in a randomized, double-blind, placebo-controlled within-subjects design. Participants performed a paradigm that examined the influence of automatic processes on cognitive control via automatic response tendencies triggered by both subliminal priming and consciously perceived flankers. Additionally, an EEG was recorded while participants performed the task. The results show that MPH decreased the size of cognitive control conflicts, as reflected by the flanker congruency effect, but only when the task had been extensively trained before (i.e. when MPH was administered during the second of two identical appointments). On the neurophysiological level, this interaction was already visible at early stages of perceptual and attentional processing, as reflected by decreased amplitude differences in the target-elicited N1. Taken together, beneficial effects of MPH were limited to situations with a high degree of automatization due to previous task execution/training. This suggests that the modulating effect of dopamine on cognitive control might increase with the degree of task automatization.

P1-28 Paradoxical, causal effects of sensory gain modulation on motor inhibitory control – A tDCS, EEG-source localization study

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Response inhibition is a key component of executive functioning, but the role of perceptual processes has only recently been focused in research. Although the interrelation of incoming information and resulting behavioral (motor) effects is well-known to depend on gain control mechanisms, the causal role of sensory gain modulation for response inhibition is elusive. We investigated the causal role of sensory gain modulations for response inhibition using a somatosensory response inhibition (Go/Nogo) task and examined the effects of parietal (somatosensory) cathodal and sham tDCS stimulation on a behavioral and neurophysiological level. For the latter, we combine event-related potential (ERP) and source localization analyses. Behavioral results reveal that cathodal stimulation leads to superior inhibition performance as compared to sham stimulation depending on the intensity of tDCS stimulation. The neurophysiological data show that an early (perceptual) subprocess of the Nogo-N2 ERP-component is differentially modulated by the type of stimulation but not a later (response-related) Nogo-N2 subcomponent. Under cathodal stimulation, the early N2 amplitude is reduced and the right inferior frontal gyrus (BA45) is less active. It is concluded that response inhibition is causally affected by sensory gain modulation. Cathodal tDCS enhances inhibition performance via decreasing the efficiency of gain control and the impact of sensory stimuli to trigger prepotent responses. Thereby, response inhibition processes, associated with structures of the response inhibition network, become less demanded.

P1-29 The flexible modulation of theta oscillations and response inhibition performance

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The successful inhibition of responses is challenging, especially whenever concurrent and conflicting information from different modalities have to be integrated. Neuronal oscillations in the theta frequency range are assumed to signal the need for cognitive control during response inhibition. It has been speculated that the ability to efficiently modulate frontal-midline theta power may be linked to the efficacy of conflict resolution and response inhibition processes. The aim of the current study is to investigate this possible interrelation of response inhibition performance and the interindividual ability to time-point dependently regulate theta oscillatory power. 40 healthy participants completed a visual-auditory interference Go-Nogo task while EEG was recorded simultaneously. The individual ability to modulate theta power was assessed by means of a theta-based neurofeedback session to naïve participants. Preliminary analyses show that individuals with higher theta modulatability display faster reaction times but commit more false alarms. This effect was reflected on the neurophysiological level by modulations of the N2. The results suggest that the ability to modulate frontal-midline theta in a time-dependent fashion may be associated with a overall more impulsive behavioural strategy: Faster responses at the expense of precise inhibitory control.

P1-30 The Spatial-Numerical Association of Response Codes (SNARC) effect in task switching

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The task switching paradigm has been extensively examined to delineate sub-processes in cognitive flexibility. There, numeric stimuli are frequently used. Yet, one striking characteristic of numeric cognition is the SNARC (spatial-numerical association of response code) effect. People who are used to a left-to-right writing system respond faster on small numbers, when the left compared to the right hand is used for the response. The opposite is the case for larger numbers. There is evidence that this effect modulates response selection processes, prior to response preparation and execution. Earlier findings suggest a great importance of response-based interference processes in task switching. However until now, it remains uncertain whether the SNARC effect is observable during task switching and what neurophysiological mechanisms mediate possible SNARC effects during cognitive flexibility. We analyzed event-related potentials (ERPs) and performed EEG decomposition (RIDE) to dissociate between different yet overlapping coding levels during task switching. The behavioral data show that task switching is affected by spatial-numerical associations with switch costs being higher when a SNARC-related response facilitation was not evident. On a neurophysiological level, these results were not supported by standard ERP analyzes, but after using RIDE. There, the behavioral patterns were paralleled by modulations of R-cluster reflecting movement-related processes of response activation. In sum, the SNARC effect modulates specific neurophysiological mechanisms at the motor control level during cognitive flexibility.

P1-31 Within-modality specific modulations of response inhibition processes by the norepinephrine system

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The efficacy of inhibitory control relies on a multitude of factors like stimulus modality. In contrast to the visual modality, processing of somatosensory stimuli relies on different cortical areas, S1 and S2. It could be shown that inhibition efficacy differs between both areas and this effect was larger in children. It is assumed that phasic norepinephrine (NE) facilitates task-related decisions in a time-point dependent fashion. The relevance of these NE modulations on neurophysiological processes relevant for response inhibition has recently been shown using the pupil diameter as index of NE activity. We hypothesize that differences in the efficacy of response inhibition processes between somatosensory areas S1 and S2 may also rely on modulating effects by the NE system. 22 adolescents completed a vibro-tactile Go-Nogo task, while simultaneously recording EEG and the pupil diameter. EEG data and pupil data were integrated by means of a correlation analysis. Response inhibition efficacy was higher for stimuli processed by S2 than by S1. This effect was modulated by NE system activity as indexed by the pupil diameter in the time range of the Nogo-P3. The results suggest that functional neuroanatomic differences between somatosensory areas to process cognitive aspects of sensory information relevant for behavioral control determine whether or not the NE system modulates neurophysiological processes important to accomplish inhibitory control.

P1-32 Divergent thinking with and without emotional context: Are specific executive control processes important for the task at hand?

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The performance outcome of divergent thinking tasks is associated with increased executive control functions. However, divergent thinking in different contexts might additionally require domain-specific executive control processes. The present study investigated if the individual capacity to think divergently in an emotional context (cognitive reappraisal) might be specifically associated with emotion related executive functions over and above the performance in a non-emotional task (alternate uses task, insights). The capacity to generate cognitive reappraisals was tested in terms of an individual's inventiveness in generating alternative appraisals of negative emotional events. Poorer basic inhibition skills (Mittenecker Pointing Test) were found to be associated with poorer divergent thinking skills in the emotional and non-emotional divergent thinking task. In accordance with hybrid models of creative thinking, executive control functions with a more prominent emotional component (humour comprehension and appreciation) showed increased associations with the fluency score in the Reappraisal Inventiveness Task. The results indicate that although divergent thinking might rely on some shared basic cognitive control processes, domain-specific executive functions might additionally contribute to creative ideation performance in more real-life creative settings.

P1-33 Emotional well-being predicts changes in executive functions during adolescence, not the other way around

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Poor executive functioning has been proposed as a risk factor for psychopathology via the mechanism of poor emotion regulation. Executive function (EF) is a broad term which generally refers to a subset of cognitive processes necessary for the control of behaviour and the successful achievement of goals. Cross-sectional studies in early in development show associations between low inhibitory control and externalising behavior, high inhibitory control and poor cognitive flexibility and internalising behaviours, and attentional control and negative affect. In adulthood, EF deficits have been noted in many mental health disorders and correlate with levels of anxiety in the general population. However little is known about the direction of the association and how this may influence vulnerability during adolescence, a period which is marked by the onset of mental health issues and a time of great change in executive function abilities and emotional reactivity. This study used the Avon Longitudinal Study of Parents And Children dataset (N=3,571–6,707) to investigate longitudinal relationships between EFs and emotional traits in adolescence. Uni and bi-directional effects between working memory and inhibitory control cognitive measures, and internalising and externalising behaviour parent-reports were assessed in early and late adolescence using a cross-lag longitudinal design. Contrary to expectation EFs did not predict changes in emotional behaviour during adolescence, but emotional behaviour did predict changes in EF, with high internalising or externalising behaviour in early adolescence predicting lower working memory in late adolescence. These results suggest that emotional well-being is key for better executive functioning during adolescence.

P1-34 Neural engagement with anti-drinking psas predicts real-world susceptibility of drinking behavior to conversational influence

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Effects of interpersonal conversations and mass media messages on attitude and behavior change interact frequently. The mechanisms facilitating this interplay are unclear, partially because it is unknown who is most susceptible to conversational influence and how these individual differences relate to message processing. We collected daily, text message-based ecological momentary assessments (EMA) of drinking behavior and alcohol-related conversations in 60 college students. Multi-level modeling results show bi-directional lagged effects so that more positive conversations led to more future drinking (conversational influence), and increased alcohol consumption led to more negative conversations in the future (hangover effect). On average, conversations were positive towards alcohol consumption. Before the EMA period, we used fMRI to assess information processing while participants were instructed to either engage positively with anti-drinking PSAs (by considering their persuasiveness or enhancing their emotional response) or to look at them naturally. We focused on differences in neural activity between these conditions within a meta-analytically defined valuation ROI to operationalize the capacity to up-regulate message-conform engagement with anti-drinking messages. This measure was significantly related to self-reported perceived message effectiveness. We then used a multi-level model to link this neural measure to real-world conversational influence on drinking behavior. Pro-drinking conversations affected drinking behavior less strongly among those who showed greater capacity for message-conform neural engagement with anti-drinking

advertisements at baseline. These findings suggest a potential mechanism for interactions between media effects and interpersonal communication. Increased value assigned to anti-drinking PSAs may act as a buffer against the negative influence of pro-alcohol conversations.

P1-35 Breath of life: Does respiration affect autonomic balance and enhance cognition?

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Contemplative activities, such as meditation or yoga, have a wide-range of beneficial effects on health, mental health and cognition, as well as on the function and structure of the brain. However, there is a lack of research into factors that could cause the reported effects of these multi-modal interventions. One common component of contemplative activities is respiratory regulation; by instructions to slow breathing and extend exhalations. We will show that these breathing exercises are a prime candidate in explaining the pattern of result of contemplative activities, notably in the stress-related domain, through producing changes in the balance of the autonomic nervous system. Results of several studies using controlled breathing exercises to manipulate parasympathetic nervous system activity and enhance executive functioning will be presented.

P1-36 Does goal congruence impact pupil dilation over and above goal relevance?

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Emotional stimuli attract attention. It is unclear which aspects of affective states determine the extent of attention capture. We compared the effects of two fundamental appraisal dimensions – goal relevance and goal congruence - on attention capture by measuring changes in pupil diameter. Forty-four participants completed a modified Monetary Incentive Delay task (MID) to determine the amount of chocolate received at the end of the experiment. Perceptually simple and homogenous Landolt circles broken at different angles were associated with different task events (anticipation: "*you may win*", "*you may lose*", "*nothing happens*"; outcomes: "*you won*", "*you didn't win*", "*you lost*", "*you didn't lose*", "*nothing happened*"). Pupil size dynamics recorded with Eyelink1000 were analyzed in relation to the two appraisal dimensions. As expected, we found that pupil diameter was increased by all goal-relevant compared to neutral stimuli throughout the experiment ($p<.001$, anticipation $d=.19$, outcome $d=.52$). To assess whether goal congruence had an additional effect on attention capture we investigated the effect of three different operationalizations of the goal congruence construct. During anticipation phase congruent ("*you may win*") trials increased pupil size more than incongruent trials ("*you may lose*") ($p<.001$, $d=.09$). Models emphasizing the absolute value (congruent: "*you won*"; incongruent: "*you lost*") as well as relative value (congruent: "*you won*", "*you didn't lose*"; incongruent: "*you didn't win*", "*you lost*") of trial outcomes showed no difference in pupil dilation. Overall, these results suggest that attention capture is mainly determined by stimulus relevance.

P1-37 Attentional biases to caloric food

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Concerns about what kind of food is healthier, or more responsible from an environmental perspective, or better related to our own body ideals, has lead in recent years to an increase in dysfunctional ways of eating. This problem is not restricted to diagnosed eating disorders, but affects many people that, although not fulfilling diagnostic criteria, show a very problematical way to deal with their food choices and eating behavior. Using eye-tracking it is possible to study the way our attention is directed to different kinds of food stimuli, and possibly detect attentional bias associated with eating disorder symptomatology. The aim of this study was to examine eye movements toward different kinds of food images in individuals differing in eating disorder symptoms. Participants freely viewed sets of two different food content images: high calorie food (sweet and savory) and low calorie food (fruit and vegetable). Self-report measures of hunger, eating disorders, and mood were also obtained. The results showed that the participants with more eating disorder symptoms presented an attentional bias towards high calorie food, while the group with less symptoms distributed their attention by the two sets of pictures. Furthermore, this attentional bias was enhanced in individuals with weight concerns and a higher body mass index. In general, these results suggest an attentional bias towards caloric food stimuli for individuals more prone to eating disorders, and this may be a relevant contribution for the understanding of the role of risk factors in the development and maintenance of eating disorders.

P1-38 Neuro-behavioral mechanisms of focused attention: immediate and long-term effects

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Emotion regulation (ER) can modulate both immediate (emotional experience) and long-term (episodic memory) effects of emotion. Previous studies have mainly focused on reappraisal and suppression, strategies known to engage extensive cognitive resources. However, to help individuals with limited resources available, it is essential to also examine ER strategies that can be engaged with relatively less cognitive effort. Here we investigated the effects of a strategy considered more efficient in controlling emotional responses: *focused attention* (FA). Forty-eight healthy adults rated the emotional content of negative and neutral pictures (immediate effect) under different attentional manipulation conditions, cued immediately before image onset. Subsamples also had brain activity and eye-tracking recorded using fMRI and an Eye Link system. One week later, participants' memory for the pictures was also tested in a recognition memory task (long-term effect). Behaviorally, FA was successful in decreasing both the emotional experience and the memory for negative images. Moreover, individual differences in eye-gaze predicted emotional ratings, thus suggesting the utility of this measure in predicting the behavioral impact of FA. Preliminary analyses of brain imaging data show that focusing away from the emotional aspects of negative images increased activity in executive/attentional control regions, including the dorsolateral prefrontal cortex (dlPFC) and lateral/medial parietal cortex, and decreased activity in the amygdala. Overall, these findings demonstrate that FA is effective in decreasing both the immediate experience and the long-term memory for negative stimuli, and that these effects are linked to modulation of both top-down (dlPFC) and bottom-up (amygdala) mechanisms involved in emotion-cognition interactions.

P1-39 Does spontaneous eye blink rate predict attentional flexibility? It depends on task context

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Higher levels of tonic striatal dopamine (DA) promote updating (rather than maintenance) of working memory (WM) representations. Spontaneous eye blink rate (sEBR) has been hypothesized as an index of tonic striatal DA tone; however the relationship between sEBR and WM updating is highly nuanced and depends on specific task features. Using an attention shifting task, the present studies investigated whether the potential for interference from an old attentional set determines the direction of the relationship between sEBR and updating ability. In 2 studies (N=106, N=110), participants performed an attention shifting task, in which they had to periodically switch the colour they attended while ignoring distractor stimuli. On Perseveration-Inhibition blocks, the target and distractor colours changed roles at each switch point; thus there was a high likelihood that a previous attentional set could interfere with performance. On Pure Updating blocks, both target and distractor colours were completely novel at each switch point, so a previous attentional set could not interfere with performance. Greater sEBR predicted slower reaction times on Perseveration-Inhibition blocks when participants had recently shifted their attentional set, and this effect was largely driven by male participants. There were, however, also many inconsistent findings between the two experiments. Overall, the results underscore the importance of considering task context and potential for interference, as well as explicitly accounting for gender in studies using sEBR. Findings will be discussed in light of recent work questioning the nature of the relationship between striatal DA function and sEBR.

P1-40 It's behind my back - so it is dangerous! Psychophysiological responses to sounds presented at the different spatial locations.

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Critically for survival, the auditory system helps us detect possible salient events around us and signals the organism to shift attention to prioritized objects (Armony & LeDoux, 2010). Importantly, sounds inform about events despite their distance and spatial location, as well as occurring outside the visual field. Thus, one of the auditory system advantages is that it can more extensively monitor the spatial range of the environment (as compared to visual). As a result, we can observe auditory bias toward the rear field at attentional and emotional levels (i.e., faster detection and more intense emotions to sounds occurring behind listeners) (Asutay & Västfjäll, 2015). The presented experiment investigates psychophysiological underpinnings of affective and attentional responses to sounds presented at the different spatial locations. The participants' task was to evaluate pleasantness of tones of different frequencies (ranging from 100Hz to 10kHz) played through the speakers located 1,5m in front or on their back. At the same time, physiological responses were measured (i.e., startle eye-blink, post-auricular reflex, zygomaticus, and corrugator activity). We observed that tones of higher frequency were rated as less pleasant and along with this, they evoke greater startle eye-blink and corrugator responses. Importantly, we found support for auditory bias toward the rear field hypothesis as tones at around 2kHz were rated as less pleasant when presented on the back. This was accompanied by a slightly larger amplitude of muscle reactions. The role of auditory system as an alerting system is furtherly discussed.

P1-41 Political extremism increases attentional gating of expectancy violations

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People create meaning frameworks to make sense of the world. Moderate political or religious attitudes require individual meaning frameworks to be flexible and changeable, whereas extreme attitudes are based on fortified, rigid, and hard-to-change meaning frameworks. Research has shown that individuals with extreme (vs. moderate) political or religious attitudes react to expectancy violations with reduced neurophysiological markers of arousal. To test the assumption that these reduced immediate reactions are due to top-down attentional processes, we recorded electrophysiological activity during the presentation of normal and anomalous playing cards (N = 79). The presence of anomalous playing cards in the stimulus set boosted prestimulus alpha power, an index of top-down attentional processing, among individuals with extreme, but not moderate political attitudes. On the other hand, anomalous playing cards increased the late positive potential (LPP), a marker of allocation of attentional resources, among moderates, but not extremists. The findings support the assumptions that extremists engage in more top-down attentional processing, presumably to prevent their fortified meaning systems to be modified through novel experiences. This might partly explain why extremists also attend to perceptual anomalies less than moderates.

P1-42 Cognitive bias modification for facial interpretation: A randomised controlled trial of transfer to self-report and cognitive measures in a healthy sample

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Cognitive bias modification is a potential low-intensity intervention for mood disorders, but previous studies have shown mixed success. The current study explored whether facial interpretation bias modification (FIBM), a similar paradigm designed to shift emotional interpretation (and/or perception) of faces would transfer to: a) self-reported symptoms, and b) a battery of cognitive tasks. In a preregistered, double-blind randomised controlled trial, healthy participants received eight online sessions of FIBM (*N*=52) or eight sham sessions (*N*=52). While we replicate that FIBM successfully shifts ambiguous facial expression interpretation in the intervention group, this failed to transfer to the majority of self-report or cognitive measures. There was, however, weak, inconclusive evidence of transfer to a self-report measure of stress, a cognitive measure of anhedonia, and evidence that results were moderated by trait anxiety (whereby transference was greatest in those with higher baseline symptoms). We discuss the need for work in both larger and clinical samples, whilst urging caution that these FIBM training effects may not transfer to clinically relevant domains.

P1-43 Communication of positive emotions through odors conveyed by the human body

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Humans communicate their emotional states through cues pertaining to diverse modalities (e.g., vision, audition), thus potentially causing physiological and behavioral adaptations in the perceivers. Olfactory chemosignals also happen to transmit emotional information from a sender to

a receiver therefore establishing a multilevel correspondence between them. Current research has mainly focused on whether humans can communicate negative emotions through body odors, probably because of their arguably supposed stronger survival benefits. Although positive emotions also carry adaptive benefits that are valuable both for the individual and the society, very little is known to date about their expression and transmission via biological human odors. Furthermore, many individuals use exogenous perfumed hygiene products that are likely to interfere or modulate the transmission of information conveyed by body odor. To fully understand how positive emotional states are transferred via the olfactory modality, one should pay close attention to the interaction between endogenous (odors produced by the body) and exogenous odors (cosmetics). The presented research addresses the question whether humans communicate positive emotions through chemosignals contained in body and/or cosmetic odors, by measuring perceivers' responses in direct (self-reports, psychophysiological responses) and indirect paradigms (performance modulation in a cognitive task).

P1-44 Effects of emotional congruency and basic emotions on memory for emotional words within communicative context.

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Information congruent with prior knowledge is remembered better than incongruent information. At the same time, emotionally charged items are often remembered better, but emotional associations -worse. We investigated how emotional congruency and basic emotions influence associative memory for words in communicative context of faces. 18 subjects (females,age 22-29) took part in fMRI study. Stimuli included emotional words and faces (disgusting/fearful/neutral) from standardized datasets. During encoding sessions, words were presented with faces, emotionally congruent or incongruent. Subjects were instructed to memorize these pairs and imagine as messages and senders. During retrieval sessions, old and new words were shown, and participants indicated what was the emotion of accompanying faces. Behavioural analyses showed interaction between emotion and congruency – disgust was remembered better than fear when congruent, but not incongruent. During correct encoding, we observed that left parahippocampal gyrus was more active for incongruent than congruent pairs, while right hippocampus was more active for disgust than fear. Correct encoding of congruent disgust was specifically related to activation of right amygdala and hippocampus. During correct retrieval, right parahippocampal gyrus was more active for congruent than incongruent pairs and also for disgust than fear. Retrieval of congruent disgust activated specifically left hippocampus and medial prefrontal cortex. Here we provided behavioral and neuroimaging evidence that encoding and retrieval of verbal stimuli depends on basic emotions and emotional congruency between item and communicative context. Emotionally congruent information might be unitized more easily and only encoding and retrieval of incongruent emotional information was related to the hippocampal activation.

P1-45 Identifying emotions with EEG

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Multiple efforts have been made to localize the neural substrate of basic emotions (e.g., happiness, disgust). Instead of searching for localized brain modules, recently more advanced statistical techniques have been applied that enable the identification of distributed neural activation patterns associated with particular brain processes. In contrast to the better spatial resolution of fMRI, the better temporal resolution of EEG provides interesting opportunities for tracking experienced emotions in real time. We therefore investigated whether we could identify emotions based on neural activation by using EEG and applying multivariate pattern analysis. Participants viewed video clips that were selected in order to maximize the experience of happiness, sadness, fear and disgust while their brain activity was recorded using EEG. We decomposed the EEG signal into frequency components summed across the duration of the video clips. Then, we selected features (of the 64 electrodes x 128 frequencies) that were relevant to distinguish the emotions using a subset of the data. Finally, the remaining data was used to train and cross-validate Support Vector Machine models on emotion categories. The out of sample generalization accuracy for the multi-class classification model was 60% (compared to 25% chance), the accuracy for the multiple combinations of two-class classification models ranged from 73% to 79%. In addition, we tracked emotions over time for a video that switches from a happy content to a more sad content, and show that our classification model accurately tracks this switch, indicating that tracking emotional responses with high temporal resolution is possible with EEG.

P1-46 Neural correlates of embodied language: An fMRI study investigating neural activity during the evaluation of emotional and body-related words

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Research into the neuroscientific principles of language, particularly focusing on the close relationship between sensory, sensorimotor and affective dimensions of word stimuli, has been a topic in psychology and neuroscience for over a century. Tackling the multifaceted dimensions of different words, word categories, language and concepts of embodied language, the present study used functional magnetic resonance imaging (fMRI) to test specific influences of emotional content, type of language and body-related character of abstract words on human brain activity. Echo planar images with blood oxygen level dependent (BOLD) contrast and T1-weighted images (MPRAGE) were acquired using a 3-Tesla MRI system (Siemens Magnetom Prisma; FoV 192 mm2; spatial resolution 3×3×4 mm3; TE 35 ms; TR 1820 ms; flip angle 90°). The paradigm included emotional words (such as happy, fearful, etc.) (Herbert et al., 2008) and body-related words (Herbert et al., 2013) of positive and negative emotional valence (such as lean, curvy, etc.). Imaging data were processed using FSL (Smith et al., 2004). Preliminary results suggest a) differential neural activity in medial (suppl. motor area) and subcortical brain regions when comparing emotional and neutral words and b) differential activity in the inferior frontal gyrus, including Broca's area, when comparing body-related and neutral words. The results support a role of medial and frontal brain structures during the evaluation of abstract stimuli such as words. Emotional and body-related word processing activates brain areas outside the classic reading network, leading to the assumption of different processing depths of embodied language.

P1-47 RAMAS: The Russian Acted Multimodal Affective Set for affective computing and emotion recognition studies

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Emotion expression encompasses various types of information, including face and eye movement, voice and body motion. Emotions collected from real conversations are difficult to classify using one channel. That is why multimodal techniques have recently become more popular in automatic emotion recognition. We collected The Russian Acted Multimodal Affective Set (RAMAS) the first multimodal corpus in Russian language. This database contains approximately 7 hours of high-quality close-up video recordings of subjects faces, speech, 3D motion-capture data and such physiological signals as electro-dermal activity and photoplethysmogram. Ten actors played out interactive dyadic scenarios. Each scenario involved one of basic emotions: Anger, Sadness, Disgust, Happiness, Fear, Surprise, and social behavior – Domination and Submission. Emotions that subjects really felt during the scenarios were collected with short questionnaires (self-reports). The records were marked by 21 annotators (at least five annotators marked each scenario). The average Krippendorff's Alpha statistics for RAMAS dataset is 0.44. The proposed dataset is suitable for solving multimodal emotion recognition problem. We achieved 52,5% weighted accuracy with stacked bidirectional long short-term memory recurrent neural network and decision-level feature fusion. Analysis of self-reports revealed that actors experienced the same emotions they had played out in scenarios, and there were no significant differences between dominative and submissive scenarios for each experienced emotion. RAMAS is an open corpus that provides research community with synchronous multimodal recordings of faces, speech, gestures and physiology data. Such material is useful for various studies and automatic affective systems development.

P1-48 Synchronized psychophysiological and brain responses across healthy individuals during emotional movie watching

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Neural synchrony across participants in fMRI measurements have been studied previously related to emotional movie watching in which networks of brain areas coincided in different participants viewing similar emotional events. However, neural synchrony has not been studied with EEG frontal alpha asymmetry during emotional movie watching. Frontal alpha asymmetry reflects approach-withdrawal motivation, and it provides a tool to study temporal dynamics automatic processing of emotional contents. Here, we presented healthy adult participants with happy, sad and fearful movies. During the movie watching brain activity was measured with electroencephalography (EEG). In addition, psychophysiological responses were measured with electrodermal activity (EDA) and facial electromyography (facial EMG). EEG frontal alpha asymmetry index and psychophysiological responses will be calculated and differences will be studied between the three emotion conditions. Most importantly, the synchrony between the participants in frontal alpha asymmetry index and psychophysiological responses will be explored. Results of the study will be discussed in context of emotional arousal and approach-withdrawal motivation and importance of these in facilitating understanding of social interactions.

P1-49 The impact of moral judgments on emotional face perception: Electrophysiological evidence

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The influence of emotion on moral judgments has become increasingly prominent in recent years. While explicit normative measures are widely used to investigate this relationship, event-related potentials (ERPs) offer the advantage of a preconscious method to visualize the modulation of moral judgments. Based on Gray and Wegner's (2009) *Dimensional Moral Model*, the present study investigated whether the processing of neutral faces is modulated by moral context information. We hypothesized that neutral faces gain emotional valence when presented in a moral context and thus elicit ERP responses comparable to those established for the processing of emotional faces. Participants (*N*= 26, 13 female) were tested with regard to their implicit (ERPs) and explicit (morality rating) responses to neutral faces, shown in either a morally positive, negative, or neutral context. Higher ERP amplitudes in early (P100, N170) and later (EPN, LPC) processing stages were expected for harmful/helpful scenarios compared to neutral scenarios. Agents and patients were expected to differ for moral compared to neutral scenarios. In the explicit ratings neutral scenarios were expected to differ from moral scenarios. In ERPs, we found indications for an early modulation of moral valence (harmful/helpful) and an interaction of agency and moral valence after 80-120 ms. Later time sequences showed no significant differences. Morally positive and negative scenarios were rated as significantly different from neutral scenarios. Overall, the results indicate that the relationship of emotion and moral judgments can be observed on a preconscious neural level at an early processing stage as well as in explicit judgments.

P1-50 The role of facial mimicry in emotion recognition

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Recognising others' emotions is an essential social skill. Traditionally, this has been linked to mentalising. However, when observing facial expressions, people also partially activate the same brain areas that support production of the same expressions (simulation); this is often accompanied by spontaneous facial mimicry. While there is agreement that simulation is necessary for accurate facial expression recognition, the results about mimicry are inconsistent, and its contribution is still debated (for review: Wood et al., 2016). While mimicry is usually considered spontaneous (Dimberg, 2000), previous work suggests explicit categorization of facial expressions requires a voluntary mimicry modulation (e.g., Pistoia et al, 2010); this might be especially relevant when mentalisation alone is insufficient (e.g. ambiguous stimuli, or lack of context). Here, we present the results of two combined EEG/EMG studies assessing the role of mimicry in facial expression recognition. In Experiment 1, photographs of full blown facial expressions (anger, happiness, neutral) are presented either subliminally (50 ms) or supraliminary (200 ms) and participants (N = 25) are engaged in an explicit emotion categorization task. In Experiment 2, participants (N = 25) perform valence decisions and explicit categorisations of low-, medium- and high-intensity emotional expressions (anger, fear, happiness) along with neutral faces. In the two experiments, we look at the time-

course of mimicry activation relative to event related potentials (ERP) that have been linked to different stages of emotional processing, such as Early Posterior Negativity (EPN), linked to early automatic emotion processing; and N400, linked to conceptualisation/mentalising (N400).

P1-52 Cognitive Biases and Adolescent Worry

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Worry is a common phenomenon in adolescents, yet some young people experience excessive worries that cause significant distress and interference in their daily lives. This pathological worry is a risk factor for the development of anxiety disorders and a range of negative outcomes. Whilst the literature on worry and GAD in adults is well established, there is a relatively small body of research examining the mechanisms underlying the development and maintenance of adolescent worry. The present study investigated how cognitive biases such as attention, interpretation and memory bias are associated with worry in adolescents. Participants were 504 adolescents aged 11 to 14 (mean age = 12.9) who completed cognitive processing tasks and self-report measures. This study is part of a three-wave longitudinal study (CogBIAS-L-S) and data presented are from time-point one. The results showed that interpretation bias and memory bias were important information processing biases associated with adolescent worry. Negative interpretations of ambiguous social scenarios (beta = 0.12, p <.05) and non-social scenarios (beta = 0.10, p <.05) were related to high worry, whilst positive interpretations of ambiguous social scenarios were related to low worry (beta = -0.14, p <.05). In addition, negative memory bias was significantly associated with high worry (beta = 0.18, p <.05). A better understanding of how these cognitive biases operate during adolescence has important implications for identifying the mechanisms to target during treatments and early interventions in adolescent populations.

P1-53 Stress modulates the impact of emotional cues on action-related decision

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Stress impact our everyday decisions. The appraisal of contextual information being a likely candidate of stress's influence on decision-making (Porcelli and Delgado 2017), we address here how stress affects action choices in response to social cues. To do so, we experimentally induced stress by alternating periods of safety versus threat of unpredictable human distress screams whileparticipants from the Stress group (n=26) performed an action-related decision Task (Vilarem et al., submitted). Participants from the Non-stress group (matched for gender and anxiety trait) completed the same task in the absence of stress manipulation. The task consisted in choosing a sit in a waiting room in the presence of 2 individuals, one always displaying a neutral expression while the other displayed either a neutral, fearful or angry expression of varying intensity. First, the effectiveness of our stress manipulation was confirmed by higher levels of skin conductance responses and of subjective stress during threat compared to safe periods in the Stress group. Second, avoidance behaviors were better predicted in the presence of angry as compared to fearful expressions. Third, while the level of intensity of the emotional display (irrespective of the nature of the emotion) better predicted avoidance behaviors in Stress compared to Non-stress group, there was no significant difference between safe and threat periods in the Stress group. Our results thus suggest that stress (here as an experimental context rather than period within an experiment) increases participant's sensitivity to emotional cues, an effect which may be reinforced by the use of distress screams.

P1-54 The underlying mechanisms of sexual attraction: real-life dating experiment

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Humans choose romantic partners based on many reasons. Although bodily changes do not form or define an individual's experience, they are a crucial part of how the body and mind work together to form sexual attraction and romantic interest. In this real-life dating experiment, we measured couples' physiological reactions during their first blind date experiences. Couples were wearing eye-tracking glasses with embedded cameras and linked to physiological measurements (heartbeat, skin conductance, pupil size). This allowed us to track a whole choreography of movements, physical reactions and subtle expressions in realistic interpersonal situations. We show that emotions and attitudes towards a dating partner change across the 4 minutes speed-dating period. We further demonstrate that couples synchronize their physiological responses and that the level of this synchrony predicts the outcome of the date.

P1-55 The impact of disgust sensitivity and gender on moral judgments beyond transgression.

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Several studies showed that high Disgust Sensitivity (DS) is associated with more severe moral judgments. However, some authors argue, that the effects of DS are related to a more general, negative evaluation phenomenon that can also be observed in other areas (e.g., intelligence, aesthetics). So far, studies on morality have mainly focussed on transgressions, i.e. actions with negative valence. Based on Gray and Wegner's *Dimensional Moral Model* (2011, *Emotion Review 3*(3)), we extended previous research by including valence, i.e. morally negative, neutral, and positive actions, and the agent's gender in our design. Two hundred and sixteen Participants (115 female, M_{Age}= 23.42, *SD* = 2.72) rated 90 short dyadic scenarios with regard to the harmfulness/helpfulness of an action from an agent towards a patient. As hypothesised, valence was the strongest predictor for items being rated as helpful or harmful. In line with previous studies, participants with higher DS gave extremer ratings for negative but not for positive scenarios. In neutral scenarios, however, higher DS was associated with more positive judgments. Additionally, female participants were more extreme in their ratings in positive and negative conditions, even when controlling for the differences in DS between genders. Interestingly, male agents' actions tended to be rated as more helpful in positive and more harmful in negative scenarios. Our results indicate that a higher DS does not go along with a general tendency for negative judgments, but rather suggests a more complex pattern depending on the valence of the social action and on gender.

P1-56 Myomagnetography: Localization of facial muscular contractions through magnetoencephalography

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Skeletal muscles contract thanks to a complex series of biochemical processes that involves ions flowing inside

the muscles. This activity can be easily recorded through electromyographic electrodes (EMG). However, this electrical activity is supposed to generate also a magnetic field that should be in principle recordable by magnetometers inside a magnetoencephalography (MEG). This activity should also be localizable exploiting source reconstruction techniques. Here we asked participants to voluntarily imitate 5 facial expressions presented on the screen. We were able to succesfully reconstruct and localize muscular activity produced by the participants during the voluntarily imitation. In the future Myomagnetography (MMG) might serve clinical purposes concerning the imaging of pathological muscular activity within the head, but also experimental purposes. Related to the latter, researchers working within the affective neuroscience filed might benefit from this technique either to get rid of EMG electrodes which might affect the spontaneity of participants' facial expressions, and to record muscles not easily recordable with standard EMG equipment.

P1-57 Comparison of neuronal and cognitive mechanisms of reappraisal sub-types

A. D. Tymorek

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In consistence with existing findings reappraisal is one of the most effective strategies of emotion regulation (Webb, Miles, & Sheeran, 2012). It lowers negative affect to greater extent than attention deployment and response modulation strategies and, in opposite to suppression, does not have potentially harmful for health consequences (Gross, 2002). Reappraisal also negatively correlates with symptoms of psychopathology (Aldao & Nolen-Hoeksema, 2012). Although our knowledge about neuronal correlates of reappraisal has been enriched (Buhle et al., 2014), we still do not know what exactly makes reappraisal effective. In literature we can find many formulations of reappraisal instruction. Webb et al. (2012), basing on analysis of hundreds of studies distinguished three main instruction types: i) reappraising the emotional stimuli, ii) reappraising via perspective taking and iii) reappraising the emotional response. As it was found by Webb et al. (Webb, 2012), there are statistically significant differences between these reappraisal sub-types in terms of efficiency. However, this results are obtained by meta-analysis of many studies and do not include coexisting differences in neuronal activity patterns. In the present project two from above-mentioned reappraisal sub-strategies (reappraising stimuli and via perspective taking) are compared (in one experimental procedure) in terms of efficiency and brain activity patterns with using EEG method. Obtained results will be discussed.

P1-58 Interaction of visually and auditorily derived affect - An MEG study

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Little is known of the emergence of affect from the initial milliseconds to a conscious emotion. Also, it is not understood how cortical regions contribute to this process, and how different sensory systems interact during the emergence of affect. This study aims to address the above-mentioned aspects by comparing the patterns of activation in the visual and auditory cortices during perception of emotional, visual and auditory stimuli when primed with a stimulus from the opposing sensory domain. The study is hoped to contribute to the dynamical systems modelling of affect. Is there an interaction effect between visual and auditory cortices in relation to the primer modality (visual vs. auditory) and emotional arousal-valence dimension (low vs. high)? Are behavioural priming effects manifested differently depending on the target-primer combination? An affective priming paradigm with magnetoencephalography was used to measure whether semantically meaningful emotional pictures and sounds can be used to prime the pleasantness judgement of musical chords and black and white visual patterns. MEG (evoked field) and behavioural responses (reaction times) were measured in 20 participants. The data collection has been completed and the analysis is currently being conducted. It is hypothesized that the judgements of the auditory stimuli will be primed, as indexed by a shorter response latency and modification of the late ERP responses. It is also expected that the judgement of the visual stimuli is less susceptible to priming. Due to contradicting literature, the interaction effect of the visual and auditory cortices remains exploratory.

P1-59 The relationship between callous-unemotional traits and neural processing of facial expressions in healthy young adults

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rior research on callous-unemotional (CU) traits (e.g., lack of empathy and guilt) supports a deficit in processing distress cues (Brook et al., 2013; Herpers et al., 2014). Using a dimensional approach to CU traits, the main purpose of the present study was to investigate the neural response to emotional faces in a community sample of young adults. It was hypothesized that CU traits would be related to reduced amygdala and anterior cingulate cortex (ACC) activity in response to fearful and sad emotional faces. Functional magnetic resonance imaging (fMRI) was used to investigate neural responses to fearful, happy and sad faces among 41 participants (25 females, M age=25.44, SD=4.03). CU traits were measured by the Inventory of Callous-Unemotional Traits. Region-of-interest analyses revealed that CU traits were related to reduced right ACC activity in response to fearful faces. However, CU traits were not associated with decreased amygdala response. The results support the notion that the core affective features of psychopathy (i.e., CU traits) are related to a unique neural response to fearful faces in noncriminal individuals as well. In addition, our findings highlight the importance of considering other regions outside the amygdala, when testing the link between CU traits and fear response.

P1-60 The role of state changes of intrinsic functional connectivity in mood-congruency and emotion dynamics in daily-life: An ESM – fMRI study

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It becomes increasingly clear that responses to emotional events and stimuli are not confined to short stimulus induced changes in the BOLD signal but also have a more sustained effect on the organization of intrinsic neural activity. The role of these state-changes remains however largely unclear. In the present study we investigated the hypothesis, that state changes in the intrinsic functional connectivity after an emotional event are mediating state changes in the processing of emotional information and thereby contributing to a stabilization and generalization of the emotional experience in a sample of 38 Participants (17 male, 21 female). Positive and negative emotions were elicited in the fMRI scanner using film clips, followed by a resting phase to examine changes relative to neutral resting state, and an emotional Stroop task to assess emotion-induced influences on processing of emotional information. To explore a connection to emotion dynamics in every-day life the study also included an experience sampling part in which participants had to indicate their current emotional experience ten times a day for one week. The results indicate that state changes in intrinsic connectivity of the Salience Network are mediating the variation in the neural responses towards emotional stimuli. Furthermore individual differences in those changes are connected to the temporal dynamic of everyday life emotional experience. These findings indicate a central role of intrinsic neural activity in mood-congruency processes and emotion dynamics as well as indicating possible pathways connecting alterations in the functional organization of intrinsic brain networks to abnormal emotional experiences.

P1-61 Stimulus category modulates proactive interference related brain activity: An EEG study

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Proactive interference (PI) in working memory (WM) is the disruptive effect of no longer relevant information on memory retrieval. Despite recent studies starting to unmask the neural basis of PI, it remains unclear whether PI depends on stimulus category. We aimed to improve our understanding of the electrophysiological correlates of PI in WM by having a group of 36 young adults perform a modified recent probes task with two stimulus categories (faces and scenes) while recording electroencephalogram (EEG) activity. PI effects were found in terms of accuracy and RT. Principal component analysis of EEG signals showed a late positive component to have less positive factor scores for interference trials than non-interference trials. Further, PI effects on behaviour and EEG signals varied according to stimulus category; scene stimuli showed greater PI costs as well as a slow wave (720-1000 ms) with less negative factor scores for interference trials than non-interference trials at frontal electrodes and less positive factor scores for interference trials than non-interference trials at parietal and occipital electrodes.

P1-62 Can you sync with me? the mechanisms underlying impaired synchrony in autism

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Joint synchronized actions such as playing, dancing, conversing and even walking together along the street are merely simple examples of how interpersonal synchrony comprise a great deal of our everyday lives. Previous studies have established the importance of synchrony in promoting a range of positive social outcomes such as affiliation, cooperation and rapport, emphasizing its role in the formation of effective social interaction. The present study tested the hypothesis that impaired ability to synchronize with other members of the group characterizes individuals with high autistic traits. We used a novel computerized task in which groups of four participants, represented as colored circles, were instructed to either i) move freely [free movement condition (FM)] or (ii) move in synchrony [instructed synchrony condition (IS)]. Additionally, in a separate experiment we measured the brain activity of two interacting partners simultaneously, using fNIRS. We found a significant interaction effect between the type of condition and the level of autistic traits, indicating that individuals with high, compared to low autistic traits, were less synchronized with the group, in the IS condition. Critically, preliminary analysis of the fNIRS data show interbrain synchrony in the inferior frontal gyrus (a region associated with mimicry) during IS. These results may offer novel insights into the mechanisms that underlie the profound behavioral and neural disturbances observed in autism.

P1-63 Neural correlates of costly helping behavior in the general population and Mirror Touch Synesthesia.

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Some brain regions are active both when experiencing and witnessing somebody else in pain. These activations are often interpreted as neural correlates of empathy and are thought to motivate helping. The variability of prosocial behavior in the population is high, especially when the costs of helping increases. In Mirror Touch Synesthesia (MTS) seeing someone else being touched triggers tactile sensations on the correspondent part of the synesthete's body. It has been proposed, that these sensations result from increased activity in areas involved in vicariously experiencing other's sensations, and that this leads to increased empathy. Here, we explore if and how this influences prosociality. So far, fourteen control and one MTS participants performed a costly helping task where money could be donated to reduce the pain experienced by another individual. Preliminary results show that across all participants, the magnitude of activations in brain regions associated with the pain network (including the insula, ACC and amygdala) correlates with the trial-by-trial donation of the participants. In the MTS individual, activation in SII and IPL additionally predicted donation. Pending acquisition of further MTS participants, these result confirm that brain regions known to be implicated in pain observation are more active when individuals act more prosocially. Based on further data acquisition, we will explore whether MST individuals will act more prosocially than controls, and what brain activation patterns mediate this difference.

P1-64 Seeing it my way when there are too many other people

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In two experiments, we show that the way we judge our own visual perspective and the perspective of others is influenced by the number of other people present in the scene. In a situation where there is only one other person present, healthy adults are usually as efficient at judging

their own perspective as at judging the other person's perspective – at least in a simple visual perspective-taking task. However, we show here in the very same simple visual perspective-taking task that performance changes when there are multiple other people present who all look in the same direction: participants' performance globally decreases and they become more efficient at judging their own perspective than that of others. We show that this phenomenon occurs with different layouts of the other people in the scene. The results are discussed in relation to social factors and capacity limitations of visual perspective-taking processes.

P1-65 Visualizing human beings: image framing in photojournalism and the dehumanization of refugees

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The ways in which human beings are depicted in the media have far-reaching consequences for our attitudes towards them, their well-being and our democracies. Here, we examined how the ways in which refugees are visually framed in the media affect their dehumanization. We identified photojournalistic images depicting refugees and classified them according to the visual framing of refugees as individuals or in small groups with identifiable faces, or in large groups without recognizable facial feature, and tested if and how these two types of visual framing lead to their dehumanization. Relative to the small group condition, participants seeing refugees in large groups tended to assign less uniquely human emotional states to them. Moreover, visual framing effects were stronger in photos showing refugees arriving by sea, rather than in land, and the effects of visual framing were extended to a refugee's moral dilemma task. When using photos depicting survivors of natural disasters, visual framing did not result in their greater dehumanization. Lastly, in a within-subjects design, refugees depicted in large groups, but not survivors of natural disasters, were rated lower in warmth. These studies demonstrate the power that prevalent depictions of large groups of individuals in the media have on the public's perception of refugees as human beings. There might not be neutral ways of visually depicting refugees, but our findings contribute to debates about the influence of the media's use of visual framing as vehicles for socially constructing our attitudes towards others.

P1-66 The social side of pain. Self-related and moral contextual cues modulate pain perception during social interactions.

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Satisfying social interactions represent one of the most rewarding aspects of our life. Studies indicate that affective-motivational aspects can modulate pain perception and that social support modulates pain experience in chronic pain patients. Capitalizing on this notion, we explored whether i) the outcome (positive/negative) of a social interaction impacts pain perception; ii) the valence (positive or negative for the self) and the equity of the offer modulate pain perception. Healthy participants were asked to play a standard version of the Dictator Game (in which a player, the Dictator, determines the offer splitting an amount of money between himself and a Receiver), and a modified version where the offer consisted of groups of nociceptive stimuli. In the modified version, participants interacted as receivers with a dictator who evaluated negatively them (Social Rejection) and another who endorsed them (Social Acceptance). Participants rated the perceived fairness of each offer and the painfulness of each stimulus group. We categorized offers according to: Equity (from Very Iniquitous to Equanimous), and Valence (Favourable/Unfavourable to the receiver). Results revealed that Equity and Valence differentially modulate pain perception, with higher pain elicited by Unfavourable and by Equanimous offers. Moreover, in the economic dictator game Unfavourable offers were rated as more unfair at every level of Equity of the offer. However, in the pain dictator game, they have been rated as more unfair only in case of very unbalanced splitting (Very Iniquitous offers). Thus, ego-centered aspects (Valence), and moral categorization cues (Equanimity), differentially affect pain perception and perceived fairness.

P1-67 Motivation to confront prejudice predicts women's approach, challenge, and threat responses to sexism

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Experiencing sexism has negative consequences for women including maladaptive cardiovascular and motivational responses. We tested women's motivation to confront prejudice (MCP) as a moderator of responses to sexism using a newly validated self-report measure. Women (N = 77) engaged in a virtual interaction with a male confederate who made a sexist or neutral comment. Women were instructed to maintain group harmony or be their true self during the interaction. We measured cardiovascular reactivity to assess challenge and threat responses and cortical asymmetry to assess approach motivation. A 3-way interaction among sexism condition, harmony/true self instructions, and MCP, $F(1, 49) = 6.381$, $p = .015$, indicated after sexism, among participants with true self instructions, higher MCP predicted greater challenge whereas lower MCP predicted greater threat ($p = .089$). After sexism, among participants with harmony instructions, higher MCP predicted greater threat whereas lower MCP predicted greater challenge ($p = .061$). There were no effects for controls. A 2-way interaction between sexism condition and MCP on approach motivation, $F(1, 72) = 6.013$, $p = .017$, indicated among women higher in MCP, women in the control condition had greater approach motivation than women experiencing sexism, ($p = .072$). Women lower in MCP showed less approach in the control condition, but greater approach in the sexism condition, ($p = .078$). This pattern suggests sexism attenuates or strengthens approach motivation that differs by level of MCP. If women suppress the desire to confront sexism to maintain group harmony, they may experience maladaptive cardiovascular and motivational states.

P1-68 Characterizing body image distortion and bodily self-plasticity in anorexia nervosa via immersive virtual reality

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Body Image Distortion (BID) is a core symptom of Anorexia Nervosa and it affects both the perceptive (body overestimation) and the cognitive-emotional (body dissatisfaction) components of body image. Recent experimental evidence shows that Immersive Virtual reality (IVR) and Full Body Illusion (FBI) can alter the BID in anorexic patients (AN). We created avatars reconstructing participants' bodies, alongside a series of fatter and slimmer avatars. We measured participants' body overestimation and dissatisfaction by asking the participants (20 AN, 20 age-matched controls, all females) to choose the avatars that best resembled their real and ideal body. FBI was induced via a/synchronous visuo-tactile stimulation applied to three avatars of different sizes (the chosen avatar, one fatter and one thinner than the chosen one) observed from the first-person perspective. We recorded real and ideal body size ratings before and after the FBI, together with participants' emotional state and explicit (embodiment questionnaire) and implicit (body temperature) measures of embodiment. Compared to controls, AN chose fatter avatars in the perceived body task and thinner avatars in the ideal body task. While AN and controls showed the same explicit level of embodiment regardless of the avatars' size, AN showed lower body temperature after FBI, indicating a stronger illusion and greater body image malleability. Interestingly, AN reported more negative emotions after embodying the fatter avatar and this correlates with symptoms severity. Considering these results, we think that FBI induced in a IVR setting might represent a powerful tool in the diagnosis and treatment of BID in anorexia.

P1-69 Cognitive implications of objectification: Can women be literally perceived as objects?

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Sexual objectification is a widespread phenomenon characterized by a focus on the individual´s physical appearance over his/her mental state. It mostly targets women and reduces them to their body or body parts, as if they are capable of representing them. In other words, objectified women are perceived as if they are objects. It remains unclear, however, to what extend the object reference is only a metaphor or women literally are assimilated to objects. To investigate this issue, 3 experiments were conducted using the oddball paradigm, in which a sequence of repetitive stimuli is infrequently interrupted by a deviant stimulus (i.e., the oddball). In Experiment 1 participants completed a human vs. non-human categorization of pictures of male and female objectified human targets (scarcely dressed), while the infrequent stimuli were doll-like avatars. A significantly smaller P300 (a neural wave whose amplitude increases to the extent that the oddball stimulus is perceived as different from the repeated stimuli) was elicited by female doll-like objects among objectified women, compared to the amplitude of the P300 elicited by male doll-like stimuli among objectified men. In Experiment 2, this pattern of results was not replicated with non-objectified male and female stimuli excluding the possibility that the previous differences reflected only a gender effect. In Experiment 3, objectified stimuli were categorized on the basis of a colored border. Results confirmed that objectification occurs also if the categorization criterion is not semantically related to the human-object dimension, clearly suggesting that the female body literally has object qualities.

P1-70 How women consumers feel about thin and larger sized models, how models with different sizes affect buying behaviour, and can we make women consumers feel more positively about larger sized models by using different slogans?

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With two studies this research investigated how thin and larger sized models are perceived by women consumers, how they affect buying behaviour and whether a more positive attitude towards larger models can be created with slogans. 304 Turkish women, aged between 17 and 58, participated to the first study and took an online survey. Participants were asked to rate physical attractiveness of models with different sizes and their likeliness to buy products advertised with models with different sizes. Furthermore, participants were administered Body Self - Esteem and Socio - Cultural Attitudes Towards Appearance (SATAQ – 4) scales, and participants' body mass indexes (BMI), dieting and exercise habits were recorded. Results showed that women consumers find thin models significantly more attractive than larger models and are more likely to buy products advertised with thinner models. Also, body self – esteem, socio - cultural attitudes towards appearance, BMI, dieting and exercise habits can predict women consumers preferences. For the second study, an EEG experiment was designed to investigate whether different slogans can create a more favourable approach towards larger models. It was predicted that slogans that evoke thoughts on acceptance of different body sizes can make women consumers more positive towards larger models. A neutral and a positive slogan were created for the study. Event – related potentials (ERPs) of 21 Turkish women aged between 18 and 57 were measured while they viewed different slogans and models with different sizes. Results revealed no significant differences of late positive potential (LPP) through different conditions.

P1-71 Bodily sensations in social scenarios: Where in the body?

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Bodily states are fundamental to emotions' emergence and are believed to constitute the first step in the chain of events that culminate in emotional awareness. Recent work has given fresh support to this view by showing that distinct topographical maps exist in the body for different basic and more complex emotions. We used the same high-resolution tool (emBODY) to obtain bodily maps related to social interactions that involve establishment or loss of social bonds. We showed that clear patterns of activation/deactivation across the body emerge depending on the valence and on the characteristics of the single scenarios, but they assign a central role to psychological and physiological processes associated with head, chest and limbs. Results showed that maps related to complex social scenarios are strongly associated with bodily correlates similar to basic emotions, suggesting that the patterns of body activation/deactivation found for social scenarios might represent a combination of different basic emotions these experiences elicit. We think these maps can be of special interest to social rejection researchers, because they bridge for the first time verbal reports and neural data of

'painful' rejection experiences and sensations mapped on the body.

P1-72 The lost ability to distinguish between self and other voice following a brain lesion

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Mechanisms underlying the self/other distinction have been mainly investigated focusing on visual, tactile or proprioceptive cues, whereas very little is known about the contribution of acoustical information. Here, the ability to distinguish between self and others' voice is investigated by using a neuropsychological approach. Right (RBD) and left brain damaged (LBD) patients and healthy controls were submitted to a voice discrimination and a voice recognition task. Stimuli were paired words/pseudowords pronounced by the participant, by a familiar or unfamiliar person. In the voice discrimination task, participants had to judge whether two voices were same or different, whereas in the voice recognition task participants had to judge whether their own voice was or was not present. In the discrimination task, only RBD patients were selectively impaired when their own voice was present. By contrast, in the recognition task, both RBD and LBD patients were impaired and showed two different biases: RBD patients misattributed the other's voice to themselves, while LBD patients denied the ownership of their own voice. Thus, two kinds of bias can affect self voice recognition: we can refuse self-stimuli (voice disownership), or we can misidentify others' stimuli as our own (embodiment of others' voice). These findings reflect different impairments in self/other distinction both at behavioral and anatomical level, the right hemisphere being involved in voice discrimination and both hemispheres in the voice identity explicit recognition. The finding of selective brain networks dedicated to processing one's own voice demonstrates the relevance of self-related acoustic information in bodily self-representation.

Session

SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control

Time: **Friday, 20/Jul/2018: 1:30pm - 2:50pm** *Location:* **CZ-1**

Organizer(s): **Rocco Mennella & Julie Grèzes**

Common sense tells us that emotions cause actions, but how? Action tendencies in response to emotional stimuli are thought to have evolved to comply with basic motivational needs to approach potentially rewarding stimuli and avoid threatening ones. Thus, emotional behaviors are often conceptualized as reflexive, stimulus-driven hard-wired actions. Yet, recent studies suggest that goal-directed mechanisms also intervene during emotional behaviors, flexibly driving responses toward the more desirable outcome in the present contingency. Due to the considerable debate in the literature, this symposium aims at providing a broad characterization of the neurocognitive processes underlying emotional actions. First, Eder will present his recent work on the congruency between emotional stimuli's valence and the direction of full-body movements in a 3D virtual-reality environment, focusing on the competition between overlearned reflexes and response adaptation to contingencies. In the second talk, Roelofs will discuss the behavioral and neural correlates of the ability to control automatic defensive reactions to acute threat, and to flexibly shift between different defensive response modes. Mennella will further investigate behavioral and neural responses to social threat in an everyday-life scenario, describing how social threat shapes action execution both in a free-choice and a forced-choice task. To conclude, Ridderinkhof will present his recent work on action disposition in soccer goalkeepers blocking penalties, as an everyday-life example of emotion in action. Overall, the symposium will provide a detailed overview of the state-of-the-art research in the field of emotion and action, also giving important hints on emotional disturbances in psychopathology.

1:30pm - 1:50pm

Approach through a virtual looking-glass: Congruency relations between emotional stimuli and full-body movements in a 3D virtual world

A. B. Eder, A. Krishna, A. Sebald, W. Kunde

Department of Psychology, University of Würzburg, Germany

Research showed that humans can flexibly reconfigure manual reactions to emotional stimuli in order to produce compatible changes in a distal visual environment (i.e., approach positive and avoid negative stimuli). Using a virtual reality headset, we examined whether a similar action flexibility is observed with full-body movements in forward and backward directions that produced (non-)corresponding movements in a 3D virtual world. Experiment 1 showed that participants were faster to initiate a forward lean in response to positive stimuli and a backward lean in response to negative stimuli, even when the body lean produced a reverse movement in the virtual world (i.e., approach to negative and retreat from positive stimuli). Experiment 2 obtained an analogous congruency effect on the behavioral level with steps in forward and backward directions. Experiment 3 also used full-body steps and observed no congruency effect in the movement initiation times but a reversed congruency

effect in the movement errors when the incongruent movement contingency in the virtual world was made more salient. Overall, the results suggest that there is a presumably highly overlearned connection between emotional stimuli and full-body movements in forward and backward directions that is difficult to override with response-effect contingencies on a distal perceptual level.

1:50pm - 2:10pm

Neurophysiological control of human defensive action

F. Klumpers, M. Hashemi, A. Hulsman, W. Zhang, R. Kaldewaij, B. Figner, S. Koch, K. Roelofs
Donders Institute and behavioural Science Institute, Radboud University, The Netherlands

Recent decades have seen important progress in the delineation of neural and somatic reactions to fear stimuli. However, how these basic defensive biological reactions support human defensive action is comparatively unknown. The majority of paradigms are passive paradigms that preclude the study of defensive actions such as fight-or-flight. I will present a number of experimental paradigms by which we assessed the neurophysiological control over these defensive actions in humans, combining decision tasks with neural and autonomic measures. First, I will present a series of studies investigating the shift from the parasympathetic state of freezing to sympathetically-driven fight actions in humans. We show that stronger freezing responses in preparation for action are linked to faster and more accurate subsequent emotional action - countering common believe that freezing is a passive state or even impeding emotional action. Freezing is associated with midbrain periaqueductal gray activity in concert with the amygdala. The shift from freezing to action involves recruitment of the perigenual part of the anterior cingulate cortex (pgACC) as well as pgACC-amygdala connections. Second, I will present data on the link between anticipatory psychophysiological reactions and active avoidance behaviour in a new paradigm for assessing costly fearful avoidance. These data suggest a strong dissociation between anticipatory fear and subsequent avoidance, indicating that fear level might not be an important determinant of an individual's propensity to avoid. Together, both lines of study suggest intricate links between defensive reactions and subsequent defensive action with potential importance for affective psychopathology.

2:10pm - 2:30pm

Action decision and inhibition under social threat

R. Mennella, E. Vilarem, J. Grèzes
Département d'Études Cognitives, Ecole Normale Supérieure, France

Emotional expressions convey crucial social information (e.g., possibility to mate, threat) which influence others' behavior. Part of this influence is thought to reside in innate or overlearned responses in the receiver (e.g., escaping from imminent threat). Nonetheless, goal-directed strategies, which take into account the present motivational state and the expected social consequences of alternative actions, might also contribute to the receiver's final choice. To better understand the relationship between emotion and action, we ran two experiments which addressed free- and forced-choices respectively (i.e., choosing a seat in a waiting room), in the presence of threat-signaling displays (anger, fear). The first EEG study revealed a differential impact of threat displays on choices: anger elicited avoidance behaviors while fear prompted similar probability of approach and avoidance. Moreover, threat-signaling displays triggered fast motor activation - as indicated by beta de-synchronization over the primary motor cortex. Importantly, the preferred choice (i.e., avoiding anger) was predicted by increased delta power over by pre-SMA and dorsolateral prefrontal areas. In light of the well-known role of these latter brain areas in motor control and inhibition, the second study directly assessed the influence of threat on inhibition, by adapting our free-choice task to a stop-signal paradigm. Our preliminary results replicated a differential impact of threat displays on inhibition. Yet, as the direction of anger and fear effects didn't align with the free-choice results, we will discuss the potential contribution of both hard-wired and goal-directed processes to free- and forced-action choices under social threat.

2:30pm - 2:50pm

Emotion in Action: A predictive-processing theory approach to inferring action intentions

K. R. Ridderinkhof
Psychology / AbC, University of Amsterdam, Netherlands, The

Predictive processing theories assume that inferring another's action intentions requires a forward model of that agent's action, which can be obtained through learning by simulation. Appraisal of events vis-à-vis concerns gives rise to a determinate motive to establish a specific state of the world; the pragmatic idea of the action's effects incurs the valuation of action options and a change in action readiness in the form of incipient ideomotor capture of the selected action. Forward modeling of the sensory consequences of the selected action option allows for the evaluation and fine-tuning of anticipated action effects, which renders the emotional action impulsive yet purposive. Inverse modeling of the purposive actions as observed in others allows for inferring the motive behind that action. An empirical illustration will show how this approach may make a difference at the soccer field.

Session

SYMPOSIUM - Self-voice perception and its role in autism and auditory hallucinations

Time: **Friday, 20/Jul/2018: 1:30pm - 2:50pm**

Location: **CZ-2**

Organizer(s): **Laura Rachman & Jean-Julien *Aucouturier***

In recent years, there has been a growing interest in self-perception and self-recognition. The ability to distinguish the self from the other is important in social cognition, but this topic has mainly been studied within the visual domain (i.e. self-face or self-body recognition). While some studies on auditory self-perception have suggested that the self-voice might receive prioritized processing, other studies have reported results in the opposite direction. In this symposium, we aim to bring together and discuss these different results. In four different talks we will present recent findings on self-voice perception in healthy populations on the one hand, and from a clinical perspective on the other hand. We will present electrophysiological findings on the processing of vocal expressions of the self-voice and on the other-voice. Additionally, because several clinical disorders are linked to deficits in social cognition, we will touch upon abnormalities in self-other voice distinction and how this may manifest in people with autism spectrum conditions and people who experience auditory hallucinations.

1:30pm - 1:50pm

Automatic processing of expressive changes on self-produced and other-produced speech

L. Rachman[1,2], S. Dubal[2], J.-J. Aucouturier[1]

[1]STMS (UMR9912), IRCAM, Sorbonne Université, CNRS, France; [2]Inserm U 1127, CNRS UMR 7225, SU UMR S 1127, Institut du Cerveau et de la Moelle Epinière (ICM), Paris, France

In social interactions, people have to pay attention both who is speaking and what is being said. In particular, expressive changes heard on speech signals have to be integrated with speaker identity, differentiating e.g. self- and other-produced signals. While previous research has shown that self-related visual information processing is facilitated compared to non-self stimuli, evidence in the auditory modality remains mixed. Here, we compared electroencephalography (EEG) responses to expressive changes in sequence of self- or other-produced speech sounds, using a mismatch negativity (MMN) passive oddball paradigm. Critically, to control for speaker differences, we used programmable acoustic transformations to create voice deviants that differed from standards in exactly the same manner, making EEG responses to such deviations comparable between sequences. Our findings suggest that expressive changes on a stranger's voice are highly prioritized in auditory processing compared to identical changes on the self-voice. Other-voice deviants generate earlier MMN onset responses, and involve stronger cortical activations in a left pre-central/post-central/supramarginal gyri network suggestive of an implicitly increased recruitment of attentional resources for more socially relevant, or less internally predictable signals.

1:50pm - 2:10pm

When prediction errs: Voice-selective alterations in nonclinical voice hearers

A. Pinheiro[1], M. Schwartze[2], S. Kotz[2]

[1]Faculty of Psychology, University of Lisbon, Portugal; [2]Faculty of Psychology and Neuroscience, University of Maastricht, The Netherlands

Self-voice perception is thought to engage an internal model that generates predictions preparing the auditory cortex for upcoming sensory feedback. Auditory cortex activity is more suppressed in response to self-generated than to external voices. This is reflected in the suppression of the N1 event-related potential (ERP) of the electroencephalogram (EEG) to self- compared to externally-generated stimuli. An impaired internal model has been proposed to underlie the experience of auditory verbal hallucinations (AVH) in psychotic patients, but it remains unclear whether similar alterations are also present in nonclinical voice hearers. Similar alterations in clinical and nonclinical AVH would support the psychosis continuum hypothesis. The current study sought to answer the question of whether and how hallucination predisposition modulates sensory prediction of tones and voices as indicated by the auditory N1. Participants with low and high hallucination predisposition (n=32), classified based on their Launay-Slade Hallucination Scale (LSHS) scores, were tested in an auditory task involving presentation of self-triggered and externally triggered tones or self-voices. An increased predisposition to AVH was associated with an increased N1 response to the self-generated voice. Our findings suggest that the comparison of predicted and perceived sensory feedback to a self-generated voice is altered in AVH predisposition. Specific alterations in the processing of self-generated vocalizations may establish a core feature of the psychosis continuum.

2:10pm - 2:30pm

Self-face and self-voice recognition in Autism Spectrum conditions

A. Chakraborty, B. Chakrabarti

Centre for Autism, School of Psychology and Clinical Language Sciences, University of Reading, United Kingdom

Autism Spectrum Conditions (autism) have historically been associated with atypicalities in self processing. Commonly studied aspects of self-processing in autism relate to the Jamesian 'psychological self', and involve measures of understanding of self in relation to others. In contrast, physical self-representation is less investigated in autism. To this end, the current study tested self-other recognition in visual and auditory modalities in a sample of adults with and without autism. 30 autistic and 38 neurotypical adults filled the Autism Spectrum Quotient (AQ), and performed a 2-alternative-forced-choice self-other labelling task as they a) viewed self-other morphed faces and b) listened to self-other morphed voices, ranging from 100% to 0% self. The 'other' face/voice in these experiments belonged to an unfamiliar other. Slope of the self-recognition response curve was calculated for each participant in each modality with a logistic psychometric function fitted using maximum likelihood estimation for Weibull distribution. This slope and the morph-level for self-other category shift was computed for both modalities for each participant. Autism and control groups differed significantly in the morph-level at which the self-other category shift occurs for voices, but no such group difference was seen for faces. The slope of self-voice recognition was related to AQ, and this relationship was associated with gender differences in the autism group. No such effects were observed in the control group. These results are in line with our earlier study (Chakraborty & Chakrabarti, 2015), and points to the need for further research into gender differences in self-representation within the autistic spectrum.

2:30pm - 2:50pm

Spontaneous decoding of ambiguous speech in individuals with non-clinical auditory hallucinations

C. Lima[1,2], B. Alderson-Day[3], S. Evans[2,4], S. Krishnan[2,5], P. Shanmugalingam[2], C. Fernyhough[3], S. K Scott[2]

[1]Instituto Universitário de Lisboa (ISCTE-IUL), Lisboa, Portugal; [2]Institute of Cognitive Neuroscience, University College London, London, UK; [3]Durham University, Durham, UK; [4]University of Westminster, London, UK; [5]University of Oxford, Oxford, UK

Auditory verbal hallucinations (hearing voices) are typically associated with psychosis, but a minority of the general population also experience them frequently and without distress. These 'non-clinical' experiences offer a unique model to study hallucinations apart from confounding clinical variables, allowing for the identification of symptom-specific mechanisms. Recent theories suggest that hallucinations result from an imbalance of prior expectation and sensory information, but whether such an imbalance also shapes auditory-perceptual processes remains unexplored. Here, we examine the cortical processing of ambiguous speech in people without psychosis who regularly hear voices. Twelve non-clinical voice-hearers and 17 matched controls completed an fMRI scan while passively listening to 'sine-wave' speech (degraded speech), that was either potentially intelligible or unintelligible. Voice-hearers reported recognizing the presence of speech in the stimuli before controls, and before being explicitly informed of its intelligibility. Across both groups, intelligible sine-wave speech engaged a typical left-lateralized speech perception network. Notably, however, voice-hearers showed stronger

intelligibility responses than controls in the dorsal anterior cingulate cortex and in the superior frontal gyrus. This suggests an enhanced involvement of attention and sensorimotor processes, selectively when speech was intelligible. Altogether, these neurobehavioral findings indicate that people with hallucinatory experiences show distinct responses to meaningful auditory stimuli. A greater weighting towards prior knowledge and expectation might cause non-veridical auditory sensations in these individuals, but it might also spontaneously facilitate perceptual processing where such knowledge is required. This has implications for understanding hallucinations, and is consistent with current 'predictive processing' theories of psychosis.

Session

SYMPOSIUM - Recent developments in the neuropsychology of flavor processing

Time: *Location:* **CZ-3**

Friday, 20/Jul/2018:
1:30pm - 2:50pm

Organizer(s): **Lotte F. van Dillen**

Food and flavor perception is a multisensory experience, including the sense of smell and taste, but also texture, visual and even auditory input. These sensory inputs are sent to the brain where they may evoke separate responses and are integrated to form a unique combined flavor percept. However, the neural signature of flavor representation may change and is dependent on individual flavor preferences, internal (metabolic state) or other factors (experience, sensory dysfunction). In this symposium, recent neuroscience findings will be discussed that speak to the complexity of flavor perception. First, Veldhuizen will present neuroimaging research combined with indirect calorimetry that illuminates how both perceived sweetness and caloric load shape metabolic and brain responses to sugared beverages. Second, Leknes will discuss the role of the human the μ-opioid system in the regulation of food reward, and will present findings of the specific effects of opioid agonists (morphine) on food wanting and liking. Third, Boesveldt will presents a series of neuroimaging studies that demonstrate the involvement of a broad network in flavor perception and liking, and how this activation pattern may vary between overweight and normal weight individuals, as well as with weight loss over time. Finally, Van Dillen discusses recent neuroimaging and behavioral findings that illuminate the paradoxical role of the working memory system in taste perception and preferences, and how this may relate to mindless consumption.

1:30pm - 1:50pm

The relative contribution of sweetness and calories to carbohydrate reward

M. G. Veldhuizen[1,2]

[1]The John B. Pierce Laboratory, United States of America; [2]Psychiatry, Yale University School of Medicine

Food cues previously paired with calories become liked and facilitate the identification of reliable energy sources. Post-ingestive signals related to nutrient metabolism are thought to be the primary drivers of this reinforcement, however, the identity of the physiological signals regulating this remain elusive. In a series of neuroimaging and indirect calorimetry human studies, we examine the relative roles of caloric load and perceived sweetness in driving metabolic, perceptual, gastric and brain responses to sugared beverages. We demonstrate a non-linear association between caloric load, metabolic response, and reinforcement potency, which is driven in part by the extent to which sweetness is proportional to caloric load.

1:50pm - 2:10pm

Opioid regulation of food motivation and hedonics in healthy humans

M. Eikemo, S. Leknes

Psychology, University of Oslo, Norway

Mu-opioids are one of several neurochemicals involved in reward processing. Acute blockade of these receptors has been shown to reduce consumption of calorie-rich foods, and self-reported pleasure from eating in humans. Chronic blockade has been tested as a putative dieting drug without success, however. Here, I will discuss current knowledge on the role of human the μ-opioid system in the regulation of food reward, including recent results from my own lab on how morphine modulates liking of highly sweet drinks and motivation in response to cues for calorie-rich foods. Interestingly, we find that a moderate dose of opioid agonist does not interfere with healthy people's ability to downregulate cue-elicited food 'craving', possibly due to compensatory activation in ventrolateral prefrontal areas (preliminary result from N=63, within-subjects, placebo-controlled double-blind fMRI study). These results will be interpreted in light of current understanding of μ-opioid regulation of other rewards, such as money and social cues.

2:10pm - 2:30pm

Alterations in neural flavor processing

S. Boesveldt

Human Nutrition, Wageningen University, Netherlands, The

Food and flavor perception is a multisensory experience, including the sense of smell and taste, but also texture, visual and even auditory input. These sensory inputs are sent to the brain where they may evoke separate responses and are integrated to form a unique combined flavor percept. However, the neural signature of flavor representation may change and is dependent on individual flavor preferences, internal (metabolic state) or other factors (experience, sensory dysfunction). Recent work by the author has shown that subjective flavor preference reveals activations in OFC, ACC, and striatum; using multivariate analysis, a broader activation pattern (additionally including anterior insula) was identified that could successfully discriminate likers of a certain flavor stimulus from dislikers. In another study, we examined how food protein intake is regulated by internal state, and neural food cue responsivity. We found that protein status modulates brain responses in reward regions to savory food cues, suggesting that diet can alter brain and behavioral responses towards bodily needs. Moreover, it has been shown that neural responses to food cues may differ between overweight and normal-weight individuals, and that weight loss may also affect this. Roux-en-Y gastric bypass (RYGB) surgery is a highly effective weight-loss intervention, and patients frequently report a shift in food preferences away from high-energy foods. We investigated changes in neural reward responses to food pictures and odors, as well as neural inhibitory control processing, before and after RYGB.

Together these results highlight the multilayered plasticity of neural flavor processing.

2:30pm - 2:50pm

Too busy to taste: the paradoxical effects of working memory load on neural responses to sweet taste

L. F. van Dillen, H. van Steenbergen
Psychology Institute/Leiden Institute for Brain and Cognition, Leiden University, The Netherlands

Taste perception is an important driver of future consumption, as taste signals the nutritive value of foods and drinks and directly contributes to efficient energy use. Any factor that compromises taste perception may thus also affect consumption preferences. Here, I will discuss recent behavioral and neuroimaging findings that demonstrate how working memory load interferes with taste perception, as evidenced by reduced neural responses in primary taste and reward areas, but results in increased preferences for high sweet glucose solutions. At least for high-calorie sweet foods, people thus seem to change their consumption strategy to adjust for suboptimal taste experiences, a mechanism that I call hedonic compensation, and that may help explain mindless consumption behaviors.

Session

The self

Time: **Friday, 20/Jul/2018: 1:30pm - 2:50pm**

Location: **CZ-4**

Session Chair: **Roman Liepelt**

1:30pm - 1:50pm

Affective touch and the bodily self

M. Ambrosecchia[1], A. Germani[2], V. Gallese[1]
[1]Department of Medicine and Surgery, Unit of Neuroscience, University of Parma, Italy; [2]Department of Human Science and Education, University of Perugia, Perugia, Italy

The core of bodily self is constituted by pre-reflective aspects such as the implicit and motor-based representation of one' body along with exteroceptive, proprioceptive and interoceptive information about its physiological state. In this context of multisensory integration, touch plays a crucial role contributing to significant aspects of self-awareness. Particularly, affective touch constitutes a distinct interoceptive modality with social and affective connotations and consists in a soft and slow tactile stimulation mediated by specialized, C-tactile afferent system directed to the posterior insula, supporting an early convergence of sensory and affective signals about the body. Affective touch has been proved to enhance body ownership (e.g. the subjective embodiment during the rubber hand illusion) compared to faster (and neutral) touch. No study, to our knowledge investigated the role of affective touch in the modulation of the motor representation of the bodily self, antecedent to the sense of ownership. To answer this question, we employed a well assessed mental rotation paradigm in which participants were asked to perform a hand laterality judgment of self-other body parts along with sessions of pleasant/neutral tactile stimulation. Results confirmed a better performance when the stimuli consisted of their own dominant hand rather than others' hand (self-advantage) and highlighted the role of affective touch in its modulation. These results open new perspective in empirical definition of fundamental mechanisms implicated in the constitution of self-awareness and in treatments of self-disturbances.

1:50pm - 2:10pm

A matter of you versus me: How enhanced self-representation enables self-other distinction

R. Liepelt
Performance Psychology, German Sport University Cologne, Germany

Interacting with other individuals confronts action control systems with the problem of how to distinguish between self-generated and other-generated actions. Neuroscience studies identified two core brain regions, the anterior medial frontal cortex (aMFC) and the right temporo-parietal junction (rTPJ), to be potentially involved in resolving this problem. This study investigated the role of the aMFC and the TPJ for the online control of self-generated vs. other-generated actions in a joint Simon task using anodal and cathodal transcranial direct current stimulation. The joint Simon effect was significantly increased during cathodal stimulation of the aMFC, as compared to sham stimulation. Stimulation of the rTPJ did not modulate the joint Simon effect. Enhanced self-representation in the medial frontal cortex seems to enable self-other distinction in two-person interactions.

2:10pm - 2:30pm

Me, myself, and…you: The neural mechanisms underlying non-social and social performance monitoring in healthy females scoring low or high on psychopathic traits

S. Overgaauw[1,2], M. Jansen[1], E. de Bruijn[1,2]
[1]Clinical Psychology, Leiden University, Netherlands, The; [2]Leiden Institute for Brain and Cognition (LIBC), Leiden, The Netherlands

Monitoring performance following a mistake requires motivation to achieve a specific goal, e.g. the desire to perform well. In a social context, monitoring performance following mistakes is more complex as errors can be negative events that come along with associated distress (cooperation) or positive events leading to feelings of reward (competition). We used neuroimaging to investigate the role of individual differences in psychopathic traits on performance monitoring in a non-social and social context. 45 healthy adult females were preselected based on their scores on the Psychopathic Personality Inventory questionnaire. 21 females scoring low and 24 females scoring high on psychopathic traits performed a cannon shooting task aimed to disentangle neural mechanisms for actions that affect only agents themselves versus actions that additionally influence the monetary outcome of co-actors.
fMRI results showed a significant interaction effect for the striatum. When observing the co-actor's performance, the group scoring high on psychopathic traits showed more striatal activity when gaining money in competitive contexts (own gain at the expense of the co-actor), whereas the group scoring low on psychopathic traits showed more striatal activity when gaining money in cooperative contexts (shared gain). No group differences have been found for own performance. Additionally, making mistakes in social versus non-social contexts resulted in increased activation of the posterior medial frontal cortex in the group scoring low versus the group scoring high on psychopathic traits. Overall, these results provide new insights into neural aberrancies associated with female psychopathic traits, and highlight its role in social performance monitoring.

2:30pm - 2:50pm

Dissociating perceptual biases for self and in-group processing

F. E. Enock[1], P. L. Lockwood[1], J. Sui[2], F. Emmerling[3], G. W. Humphreys[1], M. R. C. Hewstone[1]

[1]University of Oxford, United Kingdom; [2]University of Bath, United Kingdom; [3]Technical University Munich, Germany

Self-relevant information is given high priority in many cognitive processes, from memory (Turk, Cunningham & Macrae, 2008), to perceptual (Cassidy & Gutchess, 2012; Sui, Liu & Han, 2009) tasks. For example, when social (self, friend, stranger) labels are paired with shapes people are faster to respond to self-shape pairs than shapes associated with other people (Sui, He & Humphreys, 2012). This 'self-bias' may help us to understand how we form biases for social in-groups. However, the commonality and distinction between self and group biases is unclear. The present study measured neural responses to self vs. other and in-group vs. outgroup associations for established and novel groups. During fMRI, thirty-six participants completed a task in which they associated shapes with social labels and then judged these shape-label pairings as matching or non-matching. Critically, they did so in 3 conditions: self vs. other, minimal in-group vs. out-group, and established in-group vs. out-group. Behaviourally, we found faster RTs and increased sensitivity for self and in-group stimuli compared to strangers and out-groups. This advantage was positively correlated such that the advantage for the self predicted the advantage for in-groups. Neurally, we found enhanced activity in the vmPFC and ACC for self vs. stranger, but not for in-group vs. out-group. However, neural processing related to others (strangers and out-groups), was associated with overlap in the anterior insula. These findings support the notion that vmPFC is associated with a neural bias for encoding self-relevant associations but also that there is overlap in processing strangers and out-groups.

Session

SYMPOSIUM - The social brain in context: How we (dis)engage with socio-political issues

Time: **Friday, 20/Jul/2018: 1:30pm - 2:50pm**

Location: **CZ-5**

Organizer(s): **Manos Tsakiris & Lou Safra**

The post-truth, devalued, and perilous socio-political times we live in require new interdisciplinary perspectives for understanding how the brain is socially engaged in challenging political environments. Safra focuses on our choice of political leaders to show that we opt for leaders who are most likely to succeed in a given context independently of their leadership abilities and of the consequences of this choice for our own fitness. Harris asks whether dehumanised perception is necessary or sufficient for human right violations, such as torture and genocide. Exposure to themes of revenge but not dehumanization and deactivation of DLPFC, not TPJ, increased torture escalation, questioning the role of dehumanised perception in human rights violation. Mitikidis investigates the role of dishonesty in organisations and in society and focuses on the role of moral contagion on corruptive behaviour, highlighting how we all cheat and at the same time are able to think of ourselves as honest people. Tsakiris focuses on the fake news debate to investigate how our visceral responses influence our authenticity judgments for aversive photojournalistic images, suggesting that 'feeling in seeing' is a salient signal that partly determines our beliefs in a culture powered by images. Taken together, the four talks provide novel interdisciplinary advances that draw on political social psychology, neuroscience and political sciences. The questions and tentative answers that we provide highlight how social and affective neurosciences can be relevant for understanding timely societal and political issues. We foresee these four 20minutes talk to allow time for a general discussion.

1:30pm - 1:50pm

How do we choose our leaders?

L. Safra[1], N. Baumard[2], C. Chevallier[1]

[1]Institut d'Etudes Cognitives, Laboratoire Neurosciences cognitives et computationnelles, Ecole Normale Superieure / INSERM, France; [2]Institut d'Etudes Cognitives, Institut Jean Nicod, Ecole Normale Superieure, France

Leader choice is a cornerstone of modern democracies and an important topic in social, evolutionary, and cognitive psychology . From an evolutionary perspective, effective leaders can provide important fitness benefits to their group's members, which may have led to the development of cognitive adaptations. However, both correlational and experimental data have revealed that people sometimes prefer untrustworthy and narcissistic leaders that impair group functioning, thereby damaging their own fitness. To make sense of these findings, we argue that leader preference is best construed as an exaptation of social information gathering mechanisms, leading to a simple heuristic: for each given task, people tend to choose as leaders, individuals who would perform well individually in this task—good warriors to lead an army, good football player to lead a football team, etc. Extending this mechanism to political choices, we suggest that people tend to select as a leader the candidate with the highest probability of success in their environment. Importantly, these choices would be made independently of the consequences on the group's success and the individual's fitness. This new framework explains why, in environments where there is a misalignment between the features maximising individual success and those required to increase group success such as highly uncooperative ones, individuals would vote against their interests.

1:50pm - 2:10pm

Rethinking the function of dehumanisation in human atrocities

L. Harris[1], C. Guillard[1], C. Lillie[2], B. Knapp[2], R. Wilson[3]

[1]Experimental Psychology, University College London, United Kingdom; [2]Psychology and Neuroscience, Duke University, United States; [3]School of Law, University of Connecticut, United States

Folk and academic theories link dehumanisation--denying another's full humanity-- with a range of human atrocities, including torture and genocide. However, there exists no scientific evidence that dehumanisation plays a causal role in such atrocities. Here, we begin to test the idea that a dehumanised perception--failing to engage social cognition to another human being--may not be critical for torture and genocide since in both cases the perpetrator may want to know that the other is suffering, and dehumanisation will prevent access to such information (Rai et al., 2017). In the first study, participants listen to modified political speeches made by Serbian politicians during the Yugoslavian genocide of the 1990's. Speeches contained exclusively dehumanising, nationalist, revenge, or historical themes, amongst others. We found that revenge, not dehumanisation, was associated with greater endorsement of violence against the outgroup, and activated facial muscles associates with disgust and anger. In a second study, participants tortured a fictitious suspect after undergoing rTMS. We find that inactivating the right temporo-pariteal junction (RTPJ), a node in the social cognition brain network, did not enhance torture intensity and escalation; in fact it reduced both measures. Moreover, inactivating the dorsolateral prefrontal cortex (DLPFC) also reduced torture intensity and escalation,

suggesting that both cogitive control and social cognition are necessary for engaging in torture. Together, both studies begin to question the function of dehumaisation in human atrocites, suggesting that it may play a justifying, rather than causal role in such phenomena.

2:10pm - 2:30pm

How (not) to be dishonest: A discussion on corruption, morality, and pain

P. I. Mitkidis
Management & Center for Advanced Hindsight, Aarhus and Duke U, Denmark

The role of dishonesty in organisations and in society in general is detrimental. Corruption threatens the social welfare, reduces respect for authorities, kills economic resources, and creates many inequities. What motivates and nurtures dishonest behaviour? What is the role of moral contagion on corruptive behaviour? Are we bad to each other by nature? And what is the effect of pain on morality? I will -honestly- talk about the ways we all cheat and at the same time are able to think of ourselves as honest people. But all is not lost: Let's find out how pain and perceived effort can keep us honest and trustworthy.

2:30pm - 2:50pm

'Feeling in seeing' is believing: Visceral reactivity as a precursor to authenticity judgments of photojournalistic images

M. Tsakiris[1,2], S. De Beukelaer[2], R. Azevedo[2]
[1]Department of Psychology, Royal Holloway University of London, United Kingdom & The Warburg Institute, School of Advanced Study, University of London; [2]The Warburg Institute, School of Advanced Study, University of London

Photography mediates our experience of the world, especially in a culture powered by images at an unprecedented level. Social media, alternative facts, debates about post-truth and fake news make our negotiation between what is real or fake challenging. Beyond our cognitive judgments, we respond and relate to visual culture in visceral, embodied ways. We ran a series of experiments to understand how our visceral responses, as the basis of subjective feelings, influences our relation and response to aversive photojournalistic images. First, participants saw a series of aversive photojournalistic images, while we measured their neurophysiological (heartrate acceleration and heartbeat-evoked potentials) and affective arousal. Next, participants were informed that they would see the same images again and judge whether the images were real (i.e. photos capturing an event as it happened depicting genuine emotions) or fake. Thereby we were able to assess if levels of neurophysiological and affective arousal would predict their realness judgements. Higher neurophysiological and affective arousal for an image during the first session predicted the probability with which participants would judge that image as 'real'. This tight link between arousal and realness judgments was stronger in older ('digital immigrants') rather than younger participants ('digital natives'), who were more likely to judge images as 'real' but also reported less arousal. These findings highlight the crucial role that physiology plays in engaging us with imagery, beyond cognitive processing. 'Feeling in seeing' seems to be a salient signal that at least partly determines our beliefs in a culture powered by images.

Session

SYMPOSIUM - Affective influences on cognitive control: Psychological processes

Time: **Friday, 20/Jul/2018: 3:20pm - 5:00pm**

Location: **CZ-1**

Organizer(s): **Gilles Pourtois**

Cognitive control probably stands as a prototypical instance of a mental process where the boundaries with emotion processes have become increasingly fuzzy as of late. Recent data in the cognitive neuroscience literature suggest that cognitive control is readily influenced by specific affective or motivational processes either related to the actual state of the individual or his/her specific pre-dispositions. In this symposium, four speakers will present new empirical results informing about affective modulations of cognitive control, as exemplified by error monitoring or conflict processing. Sonja Kotz will present ERP and fMRI data showing that dissociable formso f cognitive control can be evidenced in the human brain when the role of valence, personality, and age are considered. Henk van Steenbergen will discuss psychophysiological and pharmacological data shedding light on the affective consequences of error detection as well as subsequent behavioral adjustments. Anja Riesel will discuss new ERP data (with a focus on the ERN and N2 components) collected in specific clinical groups characterized by either enhanced internalizing or externalizing symptoms (as well as healthy controls at risk for them) that underscore the transdiagnostic value of these specific ERP components. Last, Gilles Pourtois will present new ERP data informing about motivational effects on the ERN and hence early error detection brain mechanisms. As such,this symposium will not only inform about modulatory effects of affect on cognitive control, but it will also provide an updated state of the art regarding some of the psychophysiological methods currently used in the field to explore them.

3:20pm - 3:40pm

Does emotional valence affect executive control?

S. A Kotz
Faculty of Psychology and Neuroscience, Maastricht University, Netherlands, The

Recent multi-methods work in our lab has focused on two essential questions namely, does and in what way (i) emotional valence affect executive control, and (ii) do personality traits, subclinical profiles (i.e., effortful control, depression, anxiety), and age influence this potential interface between emotion and executive control. In particular, we have scrutinized whether valence (positive, negative) activates different cortical and subcortical brain regions that constitute the emotion and execute control networks in cognitive conflict resolution. In my talk I will present results from healthy young and older adults to address these questions.

3:40pm - 4:00pm

The affective nature of errors and its neurochemical modulation

H. van Steenbergen
Leiden Institute for Brain and Cognition, Leiden Institute for Brain and Cognition, Netherlands, The

The ability to adaptively increase cognitive control in response to cognitive challenges is crucial for goal-

directed behavior. Building on the idea that aversive arousal triggers adaptive increases in control, I will present recent studies on the effect of errors in a Stroop-like task on facial electromyography (fEMG) and cardiac effort. Results show that error versus correctly-performed trials tend to increase corrugator muscle activation and cardiac contractility, suggesting that errors are aversive and increase subsequent effort. I will then continue by discussing a possible neurochemical mechanism that might underlie the affective modulations of post-error adaptations. Given earlier work showing that hedonic states modulate control adaptation, we hypothesized that the mu-opioid system might modulate adaptive control modulations. This was tested in a double-blind, placebo-controlled psychopharmacological study involving a Stroop-like task. We assessed the effect of naltrexone, an opioid blocker most selective to the mu-opioid system, on post-error slowing. Consistent with our hypothesis, relative to placebo, naltrexone increased post-error slowing. Collectively, these findings support the view that errors induce aversive arousal and that this triggers adaptive effort and control. Moreover, they reveal a novel role for the opioid system in modulating such effects.

4:00pm - 4:20pm

Alterations in performance monitoring as a transdiagnostic risk marker for psychopathology

A. Riesel, N. Kathmann

Psychology, Humboldt-Universität zu Berlin, Germany

The ability to detect and respond to errors and to recruit cognitive control is fundamental for successful adaptations in a changing environment. Thus it is not surprising that alterations in performance monitoring have been assumed to play a central role for the development of different types of psychopathology highlighting affective and motivational aspects of performance monitoring. In this talk I will present data supporting that hyperactive performance monitoring represents a core information-processing abnormality in obsessive-compulsive disorder (OCD) as indicated by error-related negativity and N2 in event-related brain potentials. Further, data of unaffected relatives and longitudinal data suggest that overactive error-monitoring qualifies as an endophenotype indicating vulnerability for OCD. However, results showing alterations in error-monitoring in other psychiatric disorders, including various anxiety disorders and substance use disorder (SUD), challenge the specificity and suggest that alterations in error-processing may be a transdiagnostic risk marker. To further examine this notion, data from OCD patients, healthy participants and unaffected first-degree relatives of patients with OCD, depression, anxiety disorders and SUD will be presented. Enhanced error-related brain activity was found in OCD patients and unaffected relatives of OCD patients or anxiety disorders, whereas familial risk for SUD was associated with reduced error-related brain activity. These results suggest that alterations in error-monitoring are not limited to specific symptoms or disease states but may represent a transdiagnostic risk marker that indicates vulnerability for undercontrolled behavior and risk for SUD at the one end and overcontrolled responses and OCD and anxiety at the other end.

4:20pm - 4:40pm

Effects of goal's impact on error monitoring

G. Pourtois[1], M. C. Severo[1], W. Walentowska[1], A. Moors[2]

[1]Dept of Experimental Clinical & Health Psychology, Ghent University, Belgium; [2]Center for Social and Cultural Psychology, KU Leuven, Belgium

Error detection is fundamental to enable goal adaptive behavior and self-regulation. In cognitive neuroscience, this ability has been linked to a phasic change in dopaminergic-related activity that can be captured using scalp EEG methods and more specifically, response-locked ERP data. The error-related negativity (ERN) provides a reliable electrophysiological marker of it. In this talk, I will present recent data from our lab showing how high-level contextual factors related to goal impact shape the ERN's amplitude, and hence early error monitoring. In particular, I will present ERP results from two studies performed each time in a large sample of participants showing a lower amplitude of the ERN when healthy participants were executing a simple decision task embedded in a context where its impact was artificially increased, because being allegedly diagnostic of self-regulation and academic success. Intriguingly, this decreased internal error monitoring was not accompanied by a trade-off effect whereby the processing of external evaluative feedback (as evidenced based on the FRN component) was transiently increased for example. Moreover, subjective ratings and peripheral physiology showed that this effect of goal impact on the ERN was not simply explained by asymmetric levels of arousal between conditions. These results suggest that goal impact can impinge on the ERN. I will discuss these new findings in light of theoretical models available in the literature that consider motivation as an important determinant of performance monitoring.

4:40pm - 5:00pm

Extra presentation - it is not part of this symposium, but on a closely related topic.

Effects of focused attention and open monitoring meditation on error-related processing - Behavioral and neurophysiological changes

K. Eichel[1], B. Cullen[2], W. Britton[1]

[1]Dept. of Psychiatry & Human Behavior, Brown University, USA; [2]Dept. of Psychology, University of Oregon, USA

Mindfulness consists of two components, attention regulation and emotional non-reactivity, which are reflected in the contemplative techniques: Focused Attention (FA), training to hold the focus on a certain object while de-selecting irrelevant stimuli, and Open Monitoring (OM), a moment-to-moment awareness of ongoing experience with no de-selection. Both are integrated parts of mindfulness-based interventions as treatment for depression. Because these practices are usually offered in an integrated package, the practice-specific effects and their individual contribution to wellbeing have been difficult to determine.
The aim of the current study (N=104) was to assess the cognitive, affective and behavioral consequences and neural correlates of each practice separately. The talk will focus on the consequences on error processing and its neurophysiological correlates, the error negativity (Ne/ERN) and error positivity (Pe) as event-related potentials after an erroneous response during a Sustained Attention to Response Task. Ne/ERN can be seen as error detection process, whereas the Pe either reflects error awareness and/or affective processing. Only in the FA group, the Pe amplitude increased significantly from pre- to post-treatment. While the amplitude of Ne/ERN tended to decrease (i.e., become more negative) in FA, it increased for MBCT and stayed constant for OM. Furthermore, people that benefitted most (i.e. most negative change score in the depression scale IDS) showed a more negative Ne/ERN (i.e., higher decrease) after the treatment compared to before. This corresponds with the finding that FA might be the most beneficial treatment for depression. The relation of error-processing and affective disturbances will be discussed.

Session

Psychopathology

Time: **Friday, 20/Jul/2018: 3:20pm - 5:00pm**

Location: **CZ-2**

Session Chair: **Marit Ruitenberg**

3:20pm - 3:40pm

Non-motor problems in Parkinson's disease: Cognition and impulsivity

M. Ruitenberg[1], R. Seidler[2], W. Notebaert[1]

[1]Experimental Psychology, Ghent University, Belgium; [2]Applied Physiology and Kinesiology, University of Florida

Parkinson's disease (PD) is a neurodegenerative disorder associated with a loss of dopamine-producing cells in the basal ganglia. In addition to the clearly observable motor symptoms like resting tremor, slowness of movement, and rigidity, patients often experience non-motor problems. This latter type of problems is core to this presentation. First, we will present two studies relating to observations that dopaminergic medication may improve motor functions, but at the same time can impair higher cognitive functions. We found support for an adverse effect of medication on cognitive aspects of motor learning. While medication enhanced movement execution, it impaired cognitive planning processes that precede actual execution. We also evaluated the role of medication in cognitive control and observed reliable conflict adaptation for PD patients regardless of medication status. Whereas earlier work showed that mediation impaired transient (trial-by-trial) conflict adaptation (Duthoo et al., 2013), our findings suggest that more sustained cognitive control processes may not be sensitive to medication effects. Our third study investigated the neural bases of impulsivity in PD. We observed substantial differences in brain structural and functional characteristics between PD patients with and without impulsivity problems. These may underlie decision making and behavioral differences. Together, these studies show that PD is associated with deficits in motor, cognitive, and impulse control. The results may ultimately help clinicians in determining optimal medication regimens for PD patients, by determining priorities regarding direct motor effects (e.g., reducing tremor) and indirect non-motor effects (e.g., hindering cognitive or impulse control) of dopaminergic treatments.

3:40pm - 4:00pm

Allostatic load: A snapshot of stress in rural to urban migrant Chinese parents

J. P. Siegel

Silver Social Work, New York University, United States of America

This presentation reports findings of a recent (2015) research study on 2,077 parents of first grade children Shanghai, China. Thirty-four percent of the population identified with hukou status, indicating migration from a rural area. These parents self-reported the lowest income levels, lowest levels of perceived social status, highest levels of marital dissatisfaction, and difficulties in parenting. Supporting the theory of allostatic load and the mind/body connection, this population reported higher levels of depression and physical health symptoms than their peers who had not experienced migration. Physical and mental health symptoms were highest among respondents who had also experienced an additional potential stressful life event such as the untimely death of a parent during their childhood, having witnessed violence or murder, parental divorce, or experiencing a natural disaster such as an earthquake or tsunami. Only current social support was found to buffer the severity of symptoms in adults who had been exposed to multiple stressors. The six-year-old children of these parents were also found to have higher levels of somatic and behavioral symptoms as reported by their parents and school teachers. This suggests an ongoing bi-directional pattern, as parents who are faced with multiple stressors, health and mental health symptoms, may have parenting difficulties that contribute to symptoms in their children, which, in turn, adds to ongoing daily stress. This is timely research given the scarcity of mental health and prevention services in China, and unprecedented large numbers of rural to urban migrants.

4:00pm - 4:20pm

Neural correlates of reward in relation to apathy in schizophrenia: Neuroimaging and implications for novel treatment approaches

A. Aleman

Psychology, University of Groningen, Netherlands, The

A substantial proportion (approx. 50%) of patients with schizophrenia shows deficits in motivation and initiation of goal-directed behavior (i.e., apathy). This is suggestive of reward system dysfunction. To shed light on such a relationship, we conducted a meta-analysis of neuroimaging studies reporting on the neural correlates of reward processing and negative symptoms in schizophrenia. Integration of findings yielded a significant mean weighted correlation, revealing deficits in activation of reward neurocircuitry. More specifically, activation of the ventral striatum, involved in anticipation of reward, was compromised and structures that play a critical role in the ability to represent the value of outcomes and plans. In a study of VTA connectivity in the resting state in a large group of patients with schizophrenia, we found reduced connectivity with lateral prefrontal, temporal and parietal regions to be associated with higher degrees of apathy. Apathy ranks among the most debilitating symptoms of schizophrenia and represents a significant unmet need in its treatment. Quantitative integration of published findings suggests that treatment with noninvasive magnetic brain stimulation can improve negative symptoms. Previous PET-studies have shown that such stimulation may target circuits with dopaminergic innervation. A behavioral treatment approach that may also target reward-related circuits will also be discussed briefly. In conclusion, recent results regarding reward and motivated behavior in schizophrenia contribute to uncovering underlying mechanisms and may help in developing novel treatment strategies.

4:20pm - 4:40pm

The predictive role of mother, father and peer attachment in adolescents' depressive symptoms

A. Zia, S. Shahzad

Institute of Clinical Psychology, University of Karachi, Pakistan

In the present study, authors investigated the role of perceived quality of mother, father and peer attachment in adolescent depression. Previous research has indicated that significance of peer attachment should be considered in assessing psychological adjustment of adolescents along with mother and father attachment. In the present study 150 adolescents (males = 71, females = 79), studying in an urban school of Karachi, Pakistan, between the ages of 12-16 years participated. Standard multiple regression was applied to test the variables of interest. Results showed partial support for the constructed hypotheses and indicated significant, negative and moderate correlations between mother, father, peer attachment and

depression in adolescents. Furthermore, the three predictor variables; mother, father and peer attachment contributed 25.5 % variance in depression. Furthermore, mother attachment significantly contributed to depression in adolescents but father attachment and peer attachment did not show a unique, significant contribution in depression. These findings can be helpful in further analyzing the role of significant attachment figures particularly in adolescents across cultures.

4:40pm - 5:00pm

Altered hand movement behavior in athletes with a history of a sport-related concussion

I. Helmich, N. Simalla, O. Nele, J. Rebecca, R. Katharina, L. Hedda

Neurology, Psychiatry, and Psychosomatic Medicine, German Sports University, Germany

Symptoms of sport-related concussions often present physical symptoms (e.g., dizziness or headache) but also mental symptoms such as depression or irritability. Since depression has been linked to alterations in speech-accompanying hand movement behavior (e.g., Freedman and Bucci 1981), the present investigation addressed for the first time whether hand movement behavior in athletes with a history of sport-related concussions differs from non-concussed healthy controls. *Methods:* Videotaped hand movements of 34 participants with (N=23) and without (N=11) a sport-related concussion were analyzed by two independent blind raters employing the NEUROpsychological GESture System (NEUROGES) during a two-part anamnesis (part 1: reporting injuries, concussion history; part 2: reporting post-concussion symptoms). *Results:* During part 2 of the anamnesis, concussed participants show a significantly reduced hand movement activity as compared to non-concussed participants. Reduced hand movement activity correlates with the increased amounts of experienced concussions. The analysis of structural components of the movements reveals that concussed participants perform less *phasic* hand movements during part 2 of the anamnesis. The proportion of time (sec./min.) and the duration (sec./unit) of *repetitive* left hand movements correlates positively with increased post-concussive symptoms and increased self-reported irritability, respectively. *Discussion:* The present results indicate that (experienced) concussions result in altered movement behavior, particularly when experiencing more than one. Since phasic movements are associated with conceptual processes, it seems that concussed individuals perform less „complex" hand movements. Repetitive hand movement structures might reflect increased mental post-concussive symptoms. We therefore conclude that concussions have cumulative effects on nonverbal hand movement behavior.

Session

SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions

Time: **Friday, 20/Jul/2018: 3:20pm - 5:00pm**

Location: **CZ-3**

Organizer(s): **Mathias Weymar & Florin Dolcos**

Emotional memories, especially unpleasant ones, can be extremely robust and long-lasting, which in extreme circumstances can contribute to the development of mood, anxiety, and stress-related disorders. Despite abundant evidence showing enhanced memory for emotional aspects of events, less is known about the underlying mechanisms of memory for surrounding contextual information. This is of particular interest, because dysfunctional integration of item-context information in memory traces may play a critical role in the symptomatology of affective disturbances (e.g., intrusive memory reactivations in post-traumatic stress disorder, PTSD). The present symposium discusses new evidence from multi-method approaches (behavioral, eye-tracking, brain potentials, neuroimaging) on factors influencing the binding of items and contextual information comprising emotional events, in healthy functioning and psychopathology. Moreover, it also introduces novel interventional strategies (e.g., encoding/retrieval-based attentional control and retrieval-based learning), which may be used in future treatments. First, Sakaki will present data on basic mechanisms by which emotional arousal affects memory for prioritized contextual information. Then, Weymar will present electrophysiological evidence regarding mechanisms of enhanced attentional and mnemonic processing of emotional contextual information. Next, Bisby will discuss neuroimaging data linked to disruptive effects of emotion on contextual information, and alterations associated with PTSD. Then, Vrijsen will introduce evidence for a new retrieval-based intervention method to change emotional memories in depression. Finally, Dolcos will discuss evidence from multi-method investigations supporting the effectiveness of interventional strategies, such as attentional deployment, to overcome deficits in contextual memory in healthy functioning and in PTSD.

3:20pm - 3:40pm

How emotional arousal interacts with top-down goal in affecting memory

M. Sakaki[1], J. Raw[1], D. Clewett[2], T. Ueno[3], M. Mather[4]

[1]University of Reading, United Kingdom; [2]New York University; [3]Takachiho University; [4]University of Southern California

When encountering something emotional, phasic/momentary arousal reactions induced by the event typically enhances memory for the event. In addition, there is also evidence that such transient emotional reactions can affect memory for temporally or spatially nearby information. However, previous studies provide an inconsistent set of results about how emotionally arousing stimuli influence memory for other stimuli around them. Whereas in some studies emotional arousal impaired memory for other stimuli nearby in time or space, in other studies arousal rather enhanced memory for such contextual stimuli. In a series of studies, we tested whether or not emotional arousal has opposing effects on memory, depending on the goal-relevance of contextual information. We found that emotional arousal enhances memory for contextual information when it is goal-relevant, but it impairs memory for such information when it is goal-irrelevant. In addition, the interaction between goal relevance and emotional arousal is stronger when individuals' tonic arousal state is also enhanced. These results suggest that emotional arousal does not always enhance memory for goal-relevant information and phasic arousal induced by emotional events interact with tonic arousal in affecting one's memory formation.

3:40pm - 4:00pm

Brain potentials during encoding and retrieval of emotional associates

M. Weymar[1], C. Ventura-Bort[1], J. Wendt[2], F. Dolcos[3], A. Hamm[2]

[1]Department of Psychology, University of Potsdam, Germany; [2]Department of Biological and Clinical

Psychology, University of Greifswald, Germany; [3]Department of Psychology, University of Illinois at Urbana-Champaign, USA

Much evidence indicates that memory performance is enhanced for emotional, compared to neutral, items. However, effects of an emotionally-charged context on memory for associated elements is also important in trauma and stress-related disorders, where strong memories are often activated by neutral cues due to their emotional associations. In a series of event-related potential (ERP) experiments we investigated encoding and retrieval of objects that had been actively and passively associated with emotionally arousing or neutral scenes during encoding. We found that objects previously paired with emotionally arousing background scenes immediately show heightened perceptual and sustained elaborative processing, as indicated by larger ERP P100 and larger LPP amplitudes. Moreover, when explicit retrieval is tested after one week, objects encoded in the context of emotional scenes were better recognized than objects from neutral scenes, and prompt enhanced ERP amplitudes for old, compared to new objects (ERP old/new effect), suggestion better recollection. Interestingly, ERP Old/New differences are also larger for these stimuli when presented in a free-viewing old/new task, in which no deliberate memory search is required, hence indicating that mere viewing of emotional associates automatically facilitate episodic retrieval. Our results suggest that information originally encoded in an emotional context shows better retrieval (regardless of whether memory is explicitly probed or not), which might result from heightened attention and elaborative processing at encoding. Overall, these findings advance our understanding of binding mechanisms involved in the activation of trauma-related memories by neutral environmental cues.

4:00pm - 4:20pm

Disruptive effects of negative emotion on the coherence of episodic memories

J. Bisby[1,2], A. Horner[3], D. Bush[1,2], N. Burgess[1,2]

[1]Institute of Cognitive Neuroscience, UCL, United Kingdom; [2]Institute of Neurology, UCL, United Kingdom; [3]University of York, York, United Kingdom

Events are thought to be stored in episodic memory as coherent representations, with which the constituent elements are bound together, so that a cue can trigger re-experience of all elements via pattern completion. Negative events can influence memory in complex ways, strengthening memory for the emotional content whilst impairing important associations between the content and surrounding context, and in some situations resulting in severe memory disturbances as seen in posttraumatic stress disorder (PTSD). I will discuss behavioural and neuroimaging findings showing how the presence of negative items can disrupt associative memory and reduce the coherence in which multimodal events are remembered. I will highlight the key role of the hippocampus in supporting memory coherence and the way with which negative content might down modulate its function to weaken associative encoding and impair pattern completion. I will also consider how these characteristics of memory for negative events might contribute to the development and maintenance of distressing imagery in PTSD.

4:20pm - 4:40pm

Retrieval-based memory bias modification for depression

J. N. Vrijsen[1,2], J. Dainer-Best[3], S. Witcraft[3], S. Papini[3], B. Müller[4,5], P. Hertel[6], C. Beevers[3], E. Becker[7], I. Tendolkar[1,4], J. Smits[3]

[1]Department of Psychiatry, Donders Institute for Brain, Cognition and Behaviour, Radboud Univeristy Medical Center, Netherlands, The; [2]Depression Expertise Center, Pro Persona Mental Health Care; [3]Department of Psychology & Institute for Mental Health Research, University of Texas at Austin; [4]LVR-Hospital Essen, Department for Psychiatry and Psychotherapy, Faculty of Medicine, University of Duisburg-Essen; [5]Department of Psychology, University of Wuppertal; [6]Department of Psychology, Trinity University, San Antonio; [7]Behavioural Science Institute, Radboud University Nijmegen

Negative memory bias is a risk factor for depression. Modifying memory bias, a technique called CBM-Memory, is hence expected to yield clinically relevant results. We have developed a CBM-Memory paradigm in which processes that characterize ruminative thought, a key characteristic of depression, are reduced by training participants to retrieve positive material. Retrieval-based learning is central for enhancing long-term memory, and previous results indicate that a positive memory bias can be established and that the training effects may transfer to mood and autobiographical memory. Next, we examined the clinically relevant effects of CBM-Memory in two depression vulnerable samples. Furthermore, in an attempt to create an ecologically valid and easily implementable CBM-Memory training, we recently developed e-health CBM-Memory. Dysphoric (N=100) and high-ruminating (N=101) individuals were trained to repeatedly retrieve either positive or neutral target words. Unselected individuals (N=153) used either the positive, negative, or neutral version of the e-health CBM-Memory app for three days. Transfer to autobiographical memory bias and depressive symptoms was tested, and in the e-health study also transfer to verbal explicit memory bias. In the vulnerable samples, the CBM-Memory training yielded training-congruent recall, but did not transfer to autobiographical memory nor to depressive symptoms. The positive e-health CBM-Memory condition resulted in more positive autobiographical memory compared to the other conditions, but did not yield more positive explicit memory bias nor symptom change. Overall, these findings suggest that retrieval-based learning may be an effective strategy to change emotional memory, but it may not result in symptom change.

4:40pm - 5:00pm

The impact of emotion on relational memory: behavioral, eye-tracking, and brain imaging evidence

F. Dolcos[1], M. O'Brien[1], Y. Katsumi[1], Y. Hu[1], C. Williams[1], A. Iordan[2], E. Denkova[3], H. Berenbaum[1], S. Dolcos[1]

[1]Psychology, University of Illinois at Urbana-Champaign, United States of America; [2]Psychology, University of Michigan, United States of America; [3]Psychology, University of Miami, United States of America

Emotional stimuli tend to capture attention, and hence are typically remembered better than neutral ones. However, not all aspects of emotional events are equally remembered - possibly because of initial narrowing of attentional focus by emotional arousal, unpleasant information tends to be remembered with fewer contextual details. In extreme circumstances, this may lead to gist-based retrieval of traumatic memories, as observed in PTSD. First, I will introduce a model proposing that gist-based retrieval in PTSD is linked to "decontextualized encoding" due to extreme arousal, which in turn leads to non-specific retrieval of memories for distressing events and perpetuation of PTSD symptoms. Then, I will present behavioral, eye-tracking, and brain imaging evidence supporting the effectiveness of an emotion regulation (ER) strategy (focused attention, FA) in reducing both the emotional (re)experience and memory for emotional stimuli, during encoding and retrieval. Functional MRI data show that FA manipulation

involves interplays among brain regions involved in cognitive control (prefrontal cortex, PFC), emotion processing (amygdala), and processing of contextual information (parahippocampal cortex). Interestingly, FA manipulation also leads to enhanced encoding for non-emotional contextual aspects of emotional stimuli, which holds promise for its usefulness as a training tool to "re-contextualize" memories and improve post-traumatic symptoms following distressing events. Finally, consistent with this idea, I will also present preliminary data from an intervention study in veterans showing that increased general ability to deal with emotional challenges following ER training is associated with neuroplasticity in the resting state functional connectivity of brain regions associated with attentional control.

Session

SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing

Time: *Location:* **CZ-4**

Friday, 20/Jul/2018:
3:20pm - 5:00pm

Organizer(s): **Markus Rütgen & Federica Riva**

The quality of our social engagement substantially influences our health and well-being across the lifespan. Studies of social cognition have documented behavioral and neural responses during diverse processes that are critical for adaptive behavior, such as prosocial behaviors, emotional and motor mimicry, empathy and affective sharing. Research on how these processes develop across the lifespan and how they are affected by psychiatric and neurological disorders can provide important and sometimes unpredicted insights into the mechanisms of both typical and atypical socio-affective processing. The current symposium brings together young researchers whose recent works focus on how individual differences in age, subclinical psychopathic traits and clinical conditions such as autism and depression affect socio-affective processing. Functional magnetic resonance imaging and computational modelling are the methods of choice within this symposium. First, Paul Forbes will discuss whether the social top-down response modulation model explains mimicry is socially modulated in autism spectrum disorders. Then, Sandra Tamm will talk about the influence of aging and sleep restriction on both mimicry and empathy for pain. Federica Riva will present her findings on how age modulates the effect of being in a specific emotional state on empathy for touch. Markus Rütgen will discuss the influence of major depression and antidepressants on empathy for pain in a pre- and post-treatment study. Lastly, Patricia Lockwood will present a computational modelling approach to describe how psychopathic traits and social apathy drive the effort people put into prosocial behavior.

3:20pm - 3:40pm

Is mimicry socially modulated in autism?

P. Forbes, A. Hamilton

Institute of Cognitive Neuroscience, University College London, United Kingdom

Mimicry involves unconsciously imitating the actions of others and is a powerful and ubiquitous behaviour in social interactions. Wang and Hamilton's (2012) social top-down response modulation (STORM) model proposed that the implementation of mimicry is subtly and sophisticatedly controlled by social signals, such as affiliative goals, eye-contact and social priming. Individuals who receive a diagnosis of autism have significant difficulties in everyday social interactions and there has been a long debate over whether mimicry is different in autistic people. STORM predicts that autistic people can and do mimic but, unlike neurotypical participants, fail to modulate their mimicry according to the social context. This talk will present studies which have tested STORM in autism using traditional mimicry measures, such as stimulus-response compatibility paradigms, and will also outline more recent work which has aimed to measure and modulate mimicry in virtual reality.

3:40pm - 4:00pm

The effect of sleep restriction on empathy for pain and emotional mimicry: An fMRI study in younger and older adults

S. Renberg Tamm[1,2], G. Nilsonne[1,2], J. Schwarz[1,2], C. Lamm[4], G. Kecklund[2], P. Petrovic[1], H. Fischer[3], T. Åkerstedt[1,2], M. Lekander[1,2]

[1]Department of Clinical Neuroscience, Karolinska Institute, Sweden; [2]Stress Research Institute, Stockholm University, Sweden; [3]Department of Psychology, Stockholm University, Sweden; [4]Social, Cognitive and Affective Neuroscience Unit, Department of Basic Psychological Research and Research Methods, Faculty of Psychology, University of Vienna

Age and sleep both affect emotional functioning. Sleep patterns change over the lifespan and the effect of sleep restriction on cognitive outcomes depends on age. Therefore, we investigated the effects of restricted sleep and age on empathic responses and emotional mimicry. In a randomized cross-over experimental design, healthy young and older volunteers (n = 47 aged 20-30 years and n = 39 aged 65-75 years) underwent 2 functional magnetic resonance imaging (fMRI) paradigms after normal sleep or night sleep restricted to 3 hours. During the empathy paradigm, participants viewed pictures of needles pricking a hand (pain) or Q-tips touching a hand (control). Irrespective of sleep condition, older participants showed increased activity in angular gyrus, superior temporal sulcus and temporo-parietal junction compared to young in response to others' pain. Age and sleep interacted so that sleep restriction caused increased unpleasantness in older participants, but not in young. However, there was no main effect of sleep restriction on empathy. During emotional mimicry, participants viewed pictures of emotional and neutral faces and rated their emotional response. For emotional mimicry, sleep restriction caused decreased subjective happiness in response to happy faces, consistent with a negativity bias. Older participants reported more angriness in response to angry faces compared to young, but no significant effect of age group or sleep restriction was seen on fMRI. Together, this could indicate that older individuals adopt a more cognitive approach in response to others' pain, while their spontaneous mimicry response is more similar to what is seen in young.

4:00pm - 4:20pm

The influence of age on emotional egocentrism

F. Riva[1], M. Tschernegg[2], M. Kronbichler[3], C. Lamm[1], G. Silani[4]

[1]Department of Basic Psychology Research and Research Methods, University of Vienna, Austria; [2]Centre for Cognitive Neuroscience, University of Salzburg, Salzburg, Austria; [3]Neuroscience Institute, Christian Doppler Clinic, Paracelsus Medical University, Salzburg, Austria; [4]Department of Applied Psychology: Health, Development, Enhancement and Intervention, Faculty of Psychology, University of Vienna, Vienna, Austria

The Emotional Egocentricity Bias refers to phenomenon for which we are influenced by our own emotional state

when empathizing with others more than we are influenced by others' emotional state when we evaluate ours. Recent studies have demonstrated that this bias occurs in young adults and to a significant greater extent in children, adolescents and older adults. In young adults, overcoming emotional egocentrism has been associated to increased activity in the right supramarginal gyrus (rSMG) and the disruption of rSMG activity has been shown to lead to a higher EEB. Higher levels of EEB in children between 6 and 13 years old compared to young adults have been associated to lower activation in rSMG and reduced connectivity between left dorso-lateral prefrontal cortex (lDLPFC) and rSMG. The current study thus aimed to disclose how changes in EEB in adolescents and older adults are associated to age-related changes in neural activity and functional connectivity. Eighty-four female participants took part to the study: 28 adolescents, 30 young adults and 26 older adults underwent MRI scanner while performing a well-validated EEB task (Silani et al. 2013). Results partly confirmed previous studies, showing that older adults have a significant higher EEB compared to YA. At the neural level, overcoming EEB was associated to lower rSMG activity in adolescents and older adults compared to young adults. Results will be discussed in light of previous developmental studies, reduced affective sharing detected in older adults and functional connectivity analysis results.

4:20pm - 4:40pm

Disentangling the effects of major depression disorder and antidepressant treatment on empathy for pain

M. Rütgen[1], C. Pletti[1], M. Tik[2], C. Kraus[3], N. Geissberger[2], M. Klöbl[3], M. Woletz[2], T. Vanicek[3], C. Windischberger[2], R. Lanzenberger[3], C. Lamm[1]

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Major depression disorder (MDD) has been hypothesized to lead to impairments in empathy in patients suffering from this widespread illness. While supposed evidence for this assumption has been found before, previous studies could not disentangle between the effects of major depression disorder per se and antidepressant treatment. We measured a sample of 29 MDD patients in two functional magnetic resonance imaging sessions before and after three months of antidepressant therapy and compared their responses to an empathy for pain task to a group of healthy controls (N=35). All subjects provided self-report ratings of others' perceived unpleasantness and self-experienced unpleasantness. No differences in empathic responding were found between controls and MDD patients before treatment. After treatment, significant decreases in both self-experienced unpleasantness and brain regions related to empathy for pain were found. Decreases in self-experienced unpleasantness over time were strongly correlated with symptom improvement. No changes in others' perceived unpleasantness were found. Contradictory to previously reported deficits in empathic responding in MDD patients, we found typical neural and behavioural responses to the pain of others before treatment. Only after antidepressant treatment, lowered responses to empathic pain were found. Absence of decreases in the evaluation of others' unpleasantness indicates unchanged awareness of others' emotional states. Our findings point to a protective effect of antidepressant therapy, helping patients to deal with emotional unpleasantness arising from the empathic experience of others' suffering.

4:40pm - 5:00pm

Prosocial Apathy: When helping others is just too much effort

M. A J Apps, P. L Lockwood

Experimental Psychology, University of Oxford, United Kingdom

Prosocial acts — those that are costly to ourselves but benefit others — are a central component of human coexistence. While the influence of financial and moral costs on prosocial behaviours are relatively well understood, everyday prosocial acts do not typically come at such costs. Instead, they require the motivation to exert effort. Using computational modeling of a novel effort-based decision-making task we are able to probe people's willingness to choose to exert effort - and the subsequent force exerted into actions - that benefit oneself or another person. Here, I will present research in healthy adults and patients showing that people are prosocially apathetic. People are less willing to choose to initiate highly effortful acts that benefit others. Moreover, even when choosing to initiate effortful prosocial acts, people exhibit superficiality, exerting less force into the actions that benefit others than those that benefit themselves. Such prosocial apathy replicates whether the other person is anonymous or not, when choices are made to earn rewards or avoid losses, and is heightened in patients with lesions to the ventro-medial prefrontal cortex. However, prosocial apathy is not completely ubiquitous and levels of motivation to benefit others vary considerably between people. Notably, the least prosocially motivated people have higher subclinical levels of psychopathy and social apathy. These results show that although people sometimes 'help out', they are less willing to work to benefit others and sometimes that prosociality is superficial.

Session

SYMPOSIUM - The social neuroscience of human attachment

Time: **Friday, 20/Jul/2018: 3:20pm - 5:00pm**

Location: **CZ-5**

Organizer(s): **Pascal Vrticka**

Attachment represents one of the most fundamental behaviors in mammals, including humans. Its biological function is to orchestrate a primary social defense strategy: enhancing the chances for survival through proximity seeking in times of danger and need. Based on initial findings from animal studies, the field of social cognitive affective neuroscience has shown a high interest in investigating the behavioral, biological, and physiological substrates of human attachment, and the corresponding literature is steadily growing. Nonetheless, many issues still remain unresolved, particularly relating to the assessment of attachment quality, the latter being emphasized as the central element of human attachment by the developmental psychological framework of attachment theory. This symposium brings together a unique set of experts providing novel insights into the social neuroscience of human attachment from an attachment theory perspective. The overarching aim of the symposium is to show how inter-individual differences in attachment quality influence measures of brain activity and functional connectivity, peripheral physiology (cardiac slowing), bio-behavioral synchrony (using fNIRS), and epigenetic modification of the glucocorticoid (NR3C1) and oxytocin (OXTR) receptor gene promoters. Such knowledge will importantly contribute to strengthening

caregiver-infant bonding and promoting healthy social relationships across the life span, pointing out potential indicators of emerging mental health problems related to attachment, and informing psychotherapy success. The last presentation will integrate all the shown findings into a functional neuro-anatomical model of human attachment based on attachment theory, and there will be ample time for discussion with the entire panel of speakers at the end of the symposium.

3:20pm - 3:40pm

Neural responses to infant and adult tears: The impact of maternal love withdrawal

M. Riem

Medical and Clinical Psychology, Tilburg University, Netherlands, The

The current study examined neural responses to infant and adult tears, taking into account childhood experiences with parental love-withdrawal. With functional MRI (fMRI), we measured neural reactivity to pictures of infants and adults with and without tears on their faces in nulliparous women with varying childhood experiences of maternal use of love withdrawal. Infant tears evoked stronger responses in the visual cortex than adult tears, indicating that infant tears are highly salient. In addition, infant tears uniquely activated somatosensory pain regions, which could stimulate actions directed at the elimination of the source of pain. Furthermore, we found that individuals with experiences of love withdrawal showed less amygdala and insula reactivity to adult tears, but love withdrawal did not affect amygdala and insula reactivity to infant tears. Our findings suggest that infant tears are highly salient and may, therefore, overrule the effects of personal characteristics that influence the perception of adult crying. Shedding tears may be a strong means to elicit the parent's sharing of the infant's feelings, thereby strengthening caregiver-infant bonding and securing infant survival.

3:40pm - 4:00pm

Neural correlates of listening to attachment-specific narratives

A. L. Leutritz[1], L. Colic[1,2], V. Borchardt[1], M. Li[1], T. Nolte[3,4], M. Walter[1,5]

[1]Otto-von-Guericke-University Magdeburg, Clinical affective neuroimaging laboratory, Germany; [2]Department of Behavioral Neurology, Leibniz Institute for Neurobiology, Magdeburg, Germany; [3]Anna Freud National Centre for Children and Families, London, United Kingdom; [4]Wellcome Trust Centre for Neuroimaging, University College London, United Kingdom; [5]Clinic for Psychiatry and Psychotherapy, Eberhard-Karls University, Tuebingen, Germany

Emotional development is essentially influenced by experiences in early childhood. From early childhood on, attachment patterns are formed and influence actions, thoughts and feeling. Speech charged with attachment-dependent content was proposed to modulate the activation of cognitive-emotional schemata in listeners. First, in a behavioral study (149 healthy participants) reduced wellbeing and influences on countertransference reactions after listening to prototypical insecure narratives compared to secure speech patterns were found. This was underpinned by a higher sensitivity towards insecure-preoccupied attachment specific speech patterns of psychosomatic patients (10 patients, 10 controls). In a 7 Tesla rest-task-rest fMRI-experiment (23 healthy males), neural correlates of these mood-changing effects were explored with functional connectivity (FC) analysis. A general effect of listening was represented in a reduced FC between Caudate Nucleus (CN) and dorsolateral prefrontal cortex (DLPFC). Listening to the insecure-dismissing narrative resulted in a higher FC within a previously described 'social aversion network'. Additionally, a segregation of the 'social approach network' (represented by CN) with regions involved in mentalization processes (TPJ, PCC) was found after presentation of the insecure-dismissing narrative. Neural correlates of the moderating effect of the listener's attachment anxiety were represented in a reduced FC between CN and DLPFC as a function of individual neediness-levels. These findings suggest specific neural correlates of prolonged mood changes and schema activation induced by attachment-specific speech patterns. This insight is of special interest in psychopathological contexts, where a better understanding of countertransference reactions induced by attachment-specific speech patterns can lead to higher success psychotherapy processes.

4:00pm - 4:20pm

How mothers brake their child's heart: Cardiac slowing upon peer-exclusion mediates effects of preschoolers' representations of mothers on school-age peer problems and depression

L. O. White[1], B. Bornemann[2], A. M. Klein[1], M. J. Crowley[3], K. von Klitzing[1]

[1]Department of Child and Adolescent Psychiatry, University of Leipzig, Germany; [2]Max Planck Institute for Cognitive and Brain Science, Leipzig, Germany; [3]Yale Child Study Center, Yale University, Connecticut, USA

Children's representations of primary caregivers guide behavior in new social encounters. On-line physiology collected during social interaction enables more direct real-time assessment of children's representations, offering novel insights into the mechanism whereby representations impact future relationships and mental health. In a sample of 165 children, oversampled for emotional symptoms, we used the MacArthur Story-stem Battery to assess children's representations of mothers and fathers during preschool (Mean age = 5.19 years). This was followed by a school-age assessment (Mean age = 8.42 years) involving multi-informant reports on peer problems (mother, father, teacher) and depressive symptoms (mother, child, clinical interviewer). We sampled EKG data while children played the computerized ball-toss game (Cyberball) with two unfamiliar peers which progressed from inclusion (children received the ball regularly) to exclusion (children received the ball rarely). During "not-my-turn" events (not receiving the ball) in exclusion vs. inclusion phases, we assessed cardiac deceleration, a marker of expectancy violation. Structural equation modelling supported an indirect pathway whereby preschooolers' positive mother representations predicted increased cardiac deceleration upon not-my-turn during exclusion vs. inclusion (latent difference score), which, in turn, was associated with fewer peer problems and lower depressive symptoms. We conclude that positive representations of caregivers confer a generalized positive expectancy that becomes violated upon exclusion by unfamiliar peers, thus, protecting children from peer problems and depressive symptoms. Our study provides some of the first direct evidence that internal working models originating from early parent-child relationships guide expectancies during new encounters and, in turn, impact peer relationships and mental health.

4:20pm - 4:40pm

The effects of attachment and caregiving on neural synchrony in mother-child interactions

Q. T. Nguyen[1], E. Kayhan[2], H. Schleihauf[2], D. Matthes[2], P. Vrticka[3], S. Hoehl[1]

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Planck Institute for Human Cognitive and Brain Sciences, Germany; [3]Department of Social Neuroscience, Max Planck Institute for Human Cognitive and Brain Sciences, Germany

Previous research suggests that sensitive caregiving is associated with behavioral and physiological synchrony during mother-infant interactions (Leclère, 2014). With the recent advancements in hyperscannning the neural underpinnings of social synchrony are being discussed (Atzil et al., 2014). Here, we present a dual functional near-infrared spectroscopy (fNIRS) study looking at 36 mother-child dyads to investigate whether maternal attachment and caregiving affected neural synchrony and the quality of mother-child interaction during a problem-solving task. Wavelet transform coherence was used to assess the cross-correlation between the two fNIRS time series. Preliminary results from linear-mixed model analyses with random intercepts revealed a significant increase in neural synchrony in the dorsolateral prefrontal cortex (dlPFC) and tempo-parietal junction (TPJ) when mother and child solved the task in collaboration in comparison to individual problem solving and a resting phase with eyes closed. Further decoding neural synchrony in the collaboration condition, we found that self-reported attachment avoidance in mothers correlated with lower neural synchrony in the right dlPFC. When investigating how maternal sensitivity affected neural synchrony, the results displayed an increase in neural synchrony in the right dlPFC when mother's described themselves to be more sensitive. Moreover, we found that higher child repsonsiveness predicted higher neural synchrony in frontal areas as well. The findings underscore neural synchrony as an additional valid and promising marker for the quality of mother-child interaction and highlight the complexity of neuro-behavioral synchronization between mother and child. The results will be further discussed in relation to attachment theory.

4:40pm - 5:00pm

The social neuroscience of human attachment: State of the art and future directions

P. Vrticka[1], M. Rohr[2], T. Ein-Dor[3], W. Verbeke[4], M. Mokry[5], J. Baker[6], N. Liu[6], X. Cui[6], M. Saggar[6], H. Hosseini[6], A. Reiss[6]

[1]Department of Social Neuroscience, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany; [2]Department of Psychology, University of Leipzig, Germany; [3]Baruch Ivcher School of Psychology, Interdisciplinary Center Herzliya, Israel; [4]Business Economics, Erasmus School of Economics, Erasmus University Rotterdam, The Netherlands; [5]Division of Pediatrics, University Medical Centre Utrecht, The Netherlands; [6]Faculty of Medicine, Stanford University, Stanford, California, USA

Within the relatively young field of social cognitive affective neuroscience, the social neuroscience of human attachment has emerged only very recently. Its aim is to characterize the behavioral, biological, psychological, and physiological correlates of attachment in humans. Different theoretical frameworks describing the functional neuro-anatomical basis of human attachment exist in the literature, with a prevalence of approaches based on initial findings from animal studies and/or consideration of differences in attachment quality as a function of the type of social relationship (i.e. parent-child, friend, peer, conspecific). Based on attachment theory developed by John Bowl by and Mary Ainsworth, I have proposed an alternative functional neuro-anatomical model of human attachment that is primarily concerned with inter-individual differences in attachment within and across social relationship types. During the first part of my presentation, I will outline this model and describe its central elements distinguishing it from the other extant models in the literature. In the remainder of my talk, I will address the aspects of human attachment that still remain poorly understood and highlight some of the most promising future avenues within the scope of my functional neuro-anatomical framework. In so doing, I will show new data on (i) the neural correlates of self- and mother-face perception in 8-12 year old children as a function of anxious child attachment, (ii) the association of attachment anxiety with bio-behavioral synchrony during a collaboration task in adult dyads, and (iii) the relation between attachment avoidance and glucocorticoid and oxytocin receptor gene promoter methylation in young adults.

Session

Social cognition I

Time: **Saturday, 21/Jul/2018: 8:30am - 10:10am**

Location: **CZ-1**

Session Chair: **Hans IJzerman**

8:30am - 8:50am

Social thermoregulation: A meta-analysis

H. IJzerman
LIP/PC2S, Université Grenoble Alpes, France

Social thermoregulation refers to the idea that modern relationships are organized around processes of body temperature regulation. Since 2008, 90 published and unpublished reports appeared on this topic, with effects ranging from cold versus warm temperature effects on person perception judgments, to the consequences of social exclusion on peripheral temperature, to the relationship between diversity of the social network and core body temperature. Like any psychological research, this field is not without problems. For example, some paradigms have proven harder to replicate. We therefore conducted a meta-analysis to estimate the evidential value of the literature, as well as assess the extent to which publication bias is present in the literature. We find that there was sufficient evidential value for the relationship between temperature regulation and relationship functioning. The bias-corrected effect size estimate based on 156 eligible effect sizes and 22,577 participants was d = .11, 95% *CI* [.03, .19]; naïve multilevel MA estimate at .45. In addition, we did not find evidence for effects of temperature onto mood (bias-corrected d = .00; naïve MA d = .15). It is also clear that the social thermoregulation literature suffers from considerable publication bias. We present our results overall and for 19 coded categories for subareas of the social thermoregulation literature. We will also provide recommendations on how to move forward, and provide recommendations how to reduce publication bias and thereafter obtain a more accurate estimate of the true effect size of the social thermoregulation literature.

8:50am - 9:10am

Body posture impact on action decisions under social threat

H. Metzler[1,2], E. Vilarem[1], A. Petschen[1], G. Julie[1]
[1]Department of Cognitive Science, Ecole Normale Supérieure, PSL, Paris, France; [2]Sorbonne Universités, UPMC University Paris 06, Paris, France

Individuals' opportunities for action in threatening social contexts largely depend on their power or dominance status. While dominant individuals can afford to fight off aggressors and confront dangers, non-dominant individuals are better off avoiding direct challenges and searching for allies for social protection. Here, we investigate the hypothesis that adopting body postures associated with dominance could impact on action decisions in response to the threat-related facial expressions anger and fear. To do so, we tested whether the response choices of 79 participants in an action-related decision task (Vilarem et al., submitted) changed from a first session that served as within-subject baseline, to a second session in which participants adopted an expansive or a constrictive posture between blocks. The task consisted in choosing a seat in a waiting room in the presence of two individuals, one always displaying a neutral expression and the other a neutral, fearful or angry expression. We chose fear and anger as fear enhances cues of vulnerability and indicates the presence of a danger, whereas anger enhances cues of physical strength and signals aggressive intentions. Action decisions were measured as the proportion of choices to sit next to or away from the emotional individual. Whereas expansive postures induced no change in action decisions compared to the first session of the task, adopting a constrictive posture significantly increased the tendency to avoid angry individuals. This finding illustrates that one's own body posture might influence action tendencies in response to others' threatening facial expressions in realistic social contexts.

9:10am - 9:30am

Task-specific functional connectivity during the observation of social versus non-social touch.

H. Lee Masson, I. Pillet, H. Op de Beeck
Brain and Cognition, KU Leuven, Belgium

Humans express emotions in various ways. Among them, touch is one of the most powerful social tools used in interpersonal relationships. For example, hugging a child in fear seems to be more efficient than comforting him with words. Therefore, understanding the meaning of interpersonal touch and appropriately using it is one of the crucial skills for successful social interaction. The current study aims to identify brain network devoted to the processing of social touch information as compared to non-social touch during the observation of others` actions. The stimuli (N=75) consist of social (e.g., hugging a person) and non-social touch scenarios (e.g., carrying a box). In the scanner, 21 participants watched each video presented in an event-related design. Multiple brain areas from visual, somatosensory, and theory-of-mind (ToM) network were selected as regions of interest (ROI) for the ROI-ROI connectivity analyses. In particular, we performed a generalized Psychophysiological Interaction (gPPI)) analysis to identify task-specific connectivity changes across ROIs. Our results revealed increased functional relationship among ROIs in the ToM network (e.g., the temporoparietal junction and the superior temporal gyrus) for social touch condition as compared to non-social touch. Interestingly, the functional relationship between the ToM network (e.g., the middle temporal gyrus) and another sensory network such as the somatosensory (BA 2) or the visual area (V5)) was also increased. Conversely, ROIs from the visual network (e.g., BA17 and BA19) show increased connectivity for the non-social touch condition. The current study highlights the task-specific changes in functional communication across brain regions.

9:30am - 9:50am

Effects of intranasal oxytocin and methylation of the oxytocin receptor gene on neural and behavioral correlates of caregiving and social sensitivity

P. Bos, H. Spencer, E. Montoya
experimental psychology, Utrecht University, Netherlands, The

Infant faces have distinctive features that together are described as baby schema, a configuration that facilitates caregiving motivation and behavior, and increases the perception of cuteness. In two separate studies, we investigated the effects of intranasal oxytocin and methylation of the oxytocin receptor gene in young healthy nulliparous women on neural and behavioral responses towards infant faces of varying cuteness. First, in an fMRI study (N = 26) intranasal oxytocin administration (24IU), in contrast to our hypothesis, reduced neural responses related to caregiving motivation when observing infant faces. Second, in behavioral study (N = 81) in a similar group of participants facial electromyography

and subjective responses to the same stimuli as the fMRI study were measured, as well as methylation of the oxytocin receptor. The results show that lower methylation was related to more smiling in response to cute infants. We observed an additional effect of the use of oral contraceptives, which seemed to suppress subjective evaluations of cuteness. These studies show that the effects of oxytocin are likely to depend on specific personal characteristics, and as such our findings add to the literature that attempts to specify the role of OXT in how humans process social-emotion information.

9:50am - 10:10am

Jumping on the BADwagon: The effects of group membership on the decision to exclude others

G.-J. Lelieveld[1], L. Van Dillen[1], L. Harris[2]

[1]Social and Organizational Psychology, Leiden University, Netherlands, The; [2]Experimental Psychology, University College London, United Kingdom

Whereas most research on social exclusion focuses on the victim, only recently researchers have started to focus on the source of exclusion. What motivates people to exclude others or not? Most research so far has shown that people are exclusion averse, such that they are reluctant to exclude others from the group. The current studies, however, show that people are less reluctant to exclude others from the group when they are out-group members. In three studies (two behavioral studies, one fMRI study), we adjusted the original Cyberball task where the participant plays a computerized ball tossing game with two other players. One of the two simulated other players throws all the balls to the participant, thereby excluding the third player. There was either an in-group vs. out-group distinction, where the first player (the excluder) was an in-group en the third player (the excluded player) an out-group member from the participant, or there was no such distinction. Results showed that participants were willing to exclude out-group members than players in the game where no distinction between in- and out-group were made. This exclusion of the out-group member was associated with increased activation in the dorsal anterior cingulate cortex and dorsolateral prefrontal cortex, regions associated with cognitive conflict. The increased activation in these regions may reflect the conflict between the aversion to exclude others and the tendency to favor in-group members. These are some of the first studies that show the conditions under which people are willing to exclude others.

Session

SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation

Time:
Saturday, 21/Jul/2018:
8:30am - 10:10am

Location: **CZ-2**

Organizer(s): **Sebastian Schindler & Maimu Rehbein**

Humans can easily differentiate between emotional and neutral information. This differentiation is ultra-rapid and seemingly automatic, and may be modulated by state and context. Patients with affective disorders, specifically anxiety and depression, often show certain biases in emotional processing. However, it is yet unknown whether patients suffering from affective disorders exhibit similar biases towards emotional learning and context manipulations as healthy controls, and, importantly, if brain stimulation is able to revers or alter such biases. This symposium investigates emotional processing and its modulation in patients and control populations, combining EEG, MEG, tDCS and TMS methods. The first talk focuses on magnetoencephalographic correlates of fear conditioning in anxious adolescents, exploring the relationship of anxiety symptoms and fear generalization. In a second talk, event-related magnetic field results from healthy controls and patients with anxiety disorders are presented. In a threat-of-shock paradigm, predictable and unpredictable threat elicit a general neuronal amplification. The third talk presents affective context-dependent ERP modulation differences between depressive patients and healthy controls. The fourth talk focuses on reward processing and reinforcement learning, comparing fronto-midline Theta and frontal Alpha asymmetry between depressive patients and healthy controls before TMS treatment. Finally, in a fifth talk, valence-specific biases in affective picture processing for depressive patients relative to healthy controls are presented, and the effects of altering such biases with prolonged tDCS versus sham stimulation are discussed. Taken together, these talks outline, how biased emotion-processing for affective disorders can be influenced by learning experience, context information, and brain stimulation.

8:30am - 8:50am

Generalization of conditioned fear in anxious adolescents

I. Wessing[1,2], K. Keuper[2], T. Straube[3], M. Junghöfer[2]

[1]Department of Child and Adolescent Psychiatry, University Hospital Muenster; [2]Institute for Biomagnetism and Biosignalanalysis, University Hospital Muenster; [3]Insititute for Medical Psychology and Systems Neuroscience, University Muenster

Fear generalization, a tendency to show elevated fear responses to stimuli that resemble a fear stimulus (CS +), plays a key role in the development and maintenance of anxiety symptoms. Anxious individuals are shown to overgeneralize, with elevated fear responses also to stimuli that gradually approximate a safety-signaling CS-, resulting in a flatter fear generalization gradient. Such flatter gradient was also found in children compared to adults, suggesting that fear responses develop to be increasingly selective. As adolescence is a high-risk period for anxiety and mood disorders, it seems pivotal to investigate the neural correlates of fear generalization in relation to anxiety symptoms in this age group. In an ongoing parametric MEG-study, we recorded event-related magnetic fields and fear ratings to a continuum of 9 differently tilted Gabor gratings ranging from CS+ to CS- in adolescents with and without anxiety disorders. Estimates of neural activity revealed generalization gradients in several fear-related brain regions, e.g. vmPFC, in both early and late processing stages. These preliminary results will be discussed in relation to the participant's anxiety symptoms and compared to data in adults, using the same study design. We tentatively suggest that the vmPFC plays a key role in bottom-up and top-down fear generalization processes in both adults and adolescents.

8:50am - 9:10am

Affective face processing under conditions of predictable and unpredictable threat

I. Klinkenberg[1], A. L. Klahn[2], M. Rehbein[1], C. Steinberg[1], P. Zwanzger[3], P. Zwitserlood[4], M. Junghöfer[1]

[1]Institute of Biomagnetism and Biosignalanalysis, University Hospital Münster, Germany; [2]Department of Psychiatry, Mood and Anxiety Disorders Research U nit, University Hospital Münster, Germany; [3]kbo-Inn-Salzach-

Klinikum, Wasserburg am Inn, Germany; [4]Institute of Psychology, University of Münster, Germany

The anxiety inducing threat-of-shock paradigm has provided data on the emotional processing of predictable and unpredictable threat, but data about the processing of aversive, threat-irrelevant stimuli in this paradigm remain sparse. Hence, we investigated how neural visual processing of threat-irrelevant fearful and neutral faces is modulated by the predictability of threat. In a first study, brain responses of thirty-two healthy individuals to threat-irrelevant faces were registered via magnetoencephalography, while participating in an NPU-threat test (Neutral condition, Predictable and Unpredictable threat condition, using audio-visual threat stimuli). Estimation of neural sources revealed increasing activity in response to faces presented under increasing unpredictability of threat. This effect, located in dorsolateral prefrontal cortex, was interpreted as correlate of increasing need for emotion regulation. We obtained only main effects but no significant interaction of facial expressionand threat-conditions, neither in behavioral nor in neural data. These findings were replicated in a follow-up study with twenty phobic and twenty panic patients. Moreover, both patient groups showed decreased parietal processing of the faces, possibly indicating attentional avoidance.

9:10am - 9:30am

Affective context modulates event-related responses towards faces and words – Comparing depressive patients with healthy controls

S. Schindler[1,2]

[1]Institute of Medical Psychology and Systems Neuroscience, University of Muenster, Germany; [2]Affective Neuropsychology, Department of Psychology, Bielefeld University, Germany

Social motivation is a cornerstone of being human. Subsequently, the given social context information strongly modulate the neural responses towards visual stimuli. This talk is two folded. First, results for depressive patients and healthy controls are shown using a paradigm which manipulated self-reference and verbally presented affective information, each altering the processing of inherently neutral faces. Secondly, results are presented from a recent series of studies which used a seemingly realistic communicative setting. In these studies, supposed senders were either humans or computers, varying in their ascribed competence to give social feedback. Putatively, senders gave on-line written positive, negative, or neutral personality feedback while high-density EEG was recorded. In reality, all conditions contained random but counterbalanced feedback. ERP results consistently showed rapid sender effects, starting with the P2 and sustaining until the LPP. Putative human-generated feedback was substantially amplified, and this amplification was larger for emotional feedback. In this talk, the aggregated sender data across five studies is presented and measures of psychopathology (BDI, STAI), as well as demographic information (age, gender), are related to the magnitude of early and late sender effects. Further, valence-specific relationships are explored. Finally, preliminary data from depressive patients in this social feedback scenario are presented. These findings show that attributions by contextual information can bias and enhances stimulus-processing, thereby specifying the cortical dynamics. Our brains differentiate rapidly between relevant and irrelevant context, and within a relevant context, emotion effects are potentiated. Finally, depressive symptomatology seem to be related to specific social information.

9:30am - 9:50am

Abnormal approach-related motivation but spared reinforcement learning in MDD: Evidence from fronto-midline Theta oscillations and frontal Alpha asymmetry

D. Gheza[1], J. Bakic[1], C. Baeken[2,3], R. De Raedt[1], G. Pourtois[1]

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Major depression is characterized by abnormal reward processing and reinforcement learning (RL). This impairment might stem from deficient motivation processes, in addition to reduced reward sensitivity. In this study, we recorded 64-channel EEG in a large cohort of major depressive disorder (MDD) patients and matched healthy controls (HC) while they performed a standard RL task. Participants were asked to discover, by trial and error, several stimulus-response associations having different reward probabilities, as enforced using evaluative feedback. We extracted induced fronto-midline Theta (FMT) power time-locked to the response and feedback to ascertain RL. Furthermore, we assessed approach-related motivation by measuring frontal alpha asymmetry concurrently. At the behavioral level, MDD patients and HCs showed comparable RL. At the EEG level, FMT power systematically varied as a function of reward probability, with opposing effects found at the response and feedback levels. Although this global pattern was spared in MDD, these patients showed however a blunted FMT power increase at the feedback level when reward probability was low, selectively. Moreover, they showed impaired approach-related motivation during task execution, as reflected by frontal Alpha asymmetry. These results suggest a dissociation between (normal) RL and (impaired) approach motivation in MDD.

9:50am - 10:10am

Emotional picture processing and its modulation via tDCS in major depressive disorder

M. Rehbein[1], C. Winker[1], S. Notzon[2], V. Arolt[2], C. Wolters[1], M. Junghoefer[1]

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Patients suffering from major depressive disorder (MDD) relative to healthy controls frequently reveal biases in processing emotional material that often go along with changes in distributed neural networks. Successful treatment may result in a normalization of processing biases and neural changes. Due to its high temporal and good spatial resolution, Magnetoencephalography (MEG) is well suited for investigating the temporo-spatial dynamics of emotional processing in MDD. In two recent MEG studies, MDD patients relative to controls showed an overall reduced activation to emotional scenes in parietal and temporal cortices as well as valence-specific changes in the prefrontal cortex that ameliorated under effective antidepressant treatment with mirtazapine or electroconvulsive therapy. Here, we further investigated emotional picture processing in MDD and its susceptibility to change across treatment. Additionally, we evaluated the contribution of transcranial Direct Current Stimulation (tDCS) of the ventromedial prefrontal cortex (vmPFC) to enabling such changes in neural network activation. Two groups of MDD patients receiving two weeks of verum or sham vmPFC-tDCS additional to in-patient treatment viewed emotional scenes in the MEG. Replicating previous results, we observed the overall temporo-parietal hypoactivation to normalize with effective treatment. tDCS of the vmPFC significantly contributed to normalization and induced valence-specific changes in prefrontal cortex activation. Our findings support specific dysfunctions in (emotional) visual processing in MDD and suggest these

dysfunctions to be modulated by treatment avenues, such as tDCS.

Session

SYMPOSIUM - From social cognitive neuroscience to robotics and back – what can we learn from bidirectional links between these disciplines

Time: *Location:* **CZ-3**
Saturday, 21/Jul/2018:
8:30am - 10:10am

Organizer(s): **Agnieszka Wykowska & Giorgio Metta**

This symposium will address the question of what we can learn about human cognition thanks to the rapid development of embodied artificial agents and artificial intelligence (AI). The following topics will be included: - bidirectional link between cognitive neuroscience and robotics, - embodied humanoid robots as means to study social cognition, - modeling cognitive mechanisms in an embodied system, - brain-like AI architectures for embodied systems, - examining impairments in social cognition through interactions with robots. The symposium will consist of five 15-minutes interdisciplinary talks, and a final discussion of ca. 20 minutes. The speakers will cover a broad spectrum of disciplines, ranging from robotics and AI to cognitive and social neuroscience. We will focus on the embodiment aspect of an artificial system, and stress that embodiment plays a crucial role in modeling cognitive processes and in understanding human cognition (social cognition in particular). Implementing computational models in a robot opens new research questions, related to the embodiment itself. For example, a robot can typically employ multimodal information (e.g. motoric and visual rather than tactile and visual) to learn without explicit supervision. New learning modes can be devised seeking efficiency, real-time performance and more human-like performance. In terms of examining human social cognition, embodied robotic agents provide larger ecological validity than screen-based stimuli, and, at the same time, allow for higher experimental control than protocols involving interaction between humans. In summary, this symposium will highlight a novel methodology for studying human cognition, and will stress the benefits of interdisciplinary work.

8:30am - 8:50am

Modeling cognitive mechanisms in an embodied system

K. Twomey
Division of Human Communication, Development and Hearing, University of Manchester, UK

The nature of the cognitive mechanisms driving development has seen intense debate in psychology and neuroscience. In particular, language acquisition, a fundamental component of cognitive development, has served as a focal point. While children acquire language with apparent ease, the task is complex, since each new word a child hears can refer to a theoretically infinite set of referents (Quine, 1960). Consequently, a range of mechanisms have been proposed by which children could narrow down this referent space. For example, on constraints-based accounts, children possess or learn explicit rules about how words map to the world; on sociocommunicative accounts children capitalize on an understanding of their interlocutor's communicative intent; and on associative learning accounts the ability to learn low-level associations between words and nonlinguistic cues is sufficient to bootstrap language acquisition. In this talk we will discuss how work in developmental robotics can shed light on current controversies in the cognitive development field. We present recent research on language acquisition in developmental robots which implements the associative learning account. We discuss examples of developmental experiments illustrating children's ability to use embodied cues and existing vocabulary knowledge to learn new words. We then consider embodied developmental robotics models using iCub, which capture these empirical results (Morse et al. 2015; Morse & Cangelosi 2017; Twomey, Morse, Cangelosi & Horst, 2017). The implications for theories of cognitive development of such embodied robotic approaches will also be discussed.

8:50am - 9:10am

Using embodied humanoid robots as means to study human social cognition

A. Wykowska
Social cognition in human-robot interaction, Istituto Italiano di Tecnologia, Italy

In daily social interactions, the human brain engages various mechanisms of social cognition, such as orienting of attention to where others attend (joint attention). However, the exact conditions which elicit mechanisms of social cognition are not yet clearly understood. We address this by using experimental protocols involving an interaction with a humanoid robot. This allows maintaining excellent experimental control while introducing embodied presence of an interaction partner, thereby increasing ecological validity. In this talk, I will present a collection of studies that examined how joint attention was influenced by factors such as: - real-time mutual gaze and gaze avoidance, - contingency of the robot's gaze behavior on the human's gaze, - human-like behavior of the robot. These studies have been conducted with the use of the humanoid robot iCub, designed at the Italian Institute of Technology. We integrate iCub in interactive protocols in which we measure participants' EEG, gaze behavior (with a wireless mobile eyetracker) and performance. Our results show, for example, that gaze cueing effects are modulated by whether the robot engages participants in mutual gaze or avoids gaze. Similarly, dependent on whether the robot follows participants' gaze or not, participants re-engage attention to its face with various latencies. We propose that through the use of artificial agents and realistic interactive protocols, we can learn how human (social) cognition works in real life and that mechanisms observed in more naturalistic interactive scenarios might be missed in classical observational experimental protocols with passive stimuli presented on the screen.

9:10am - 9:30am

Narrative structuring of experience for extended social interactions in humans and robots

P. F. Dominey
Human and Robot Cognitive Systems, INSERM, France

One of the key results in modern cognitive neuroscience is that the human ability to understand and interact in the world is based on experience, via the body, in the physical and social world. A second, older and less appreciated result from developmental psychology demonstrates the crucial role of narrative in organizing this experience and allowing the developing child to make meaning from experience. This implies that the future ability of robots to understand and interact socially with humans will rely on memory systems that allow these robots to accumulate and integrate experience over extended periods of

interaction, and to be capable of enriching this experience through narrative input from humans, in a developmental approach. We have begun to address this by developing autobiographical memory systems that (a) encode extended interaction experience between robots and humans, and (b) allow for the consolidation and extraction of semantics from this experience inspired by human memory systems. More recently we have introduced a narrative language capability, such that graph-based representations called situation models are constructed from experience encoded in the ABM, and can then be enriched by narration from the human partner, thus allowing the robot to have a deeper understanding of unseen causal relations between mental motivational states, and resulting actions. This understanding is reflected in the robot's ability to generate simple narrative, as well as understand it. In return, we demonstrate how these enhanced memory systems could be used by humans who have deteriorated memory in normal and pathological aging.

9:30am - 9:50am

Brain-like architectures in AI for embodied systems

G. Metta

iCub facility, Istituto Italiano di Tecnologia, Italy

Tantalizing results from neuroscience are shedding light on the intricate connection between motor and sensory representations in the brain. We now know a great deal on how the brain controls reaching, grasping and similar visually-guided actions. Embodied models can tell us why such representations are necessary or at least whether they pay off in terms of generalization, robustness or sheer recognition rates - performance indicators with which AI has been struggling for decades. In the recent past, we therefore investigated the use of motor signals in the process of action and object recognition that showed interesting improvements. In addition, since these are intrinsically embedded models, they find their quintessential instantiation in robotic systems. In the past, scholars such as Liberman proposed that also speech production - the motor act of speech - and recognition are likely to have a shared representation in the brain. We were deeply inspired by this, and similar ideas. We showed that utilizing knowledge about speech production (a forward model) allows recovering the likely motor sequence that generated a certain phoneme (or sequence of phonemes). This helps decoding acoustic features that enable sharper separation of signal from noise. In our most recent experiment this became a full-blown automatic speech recognition system with 97.5% recognition rate at 3m distance in noisy environments. Apart from the improvement of the robot's perceptual system, resilient speech recognition can find application for patients with speech impairments or more prosaically to recognize foreign accents.

9:50am - 10:10am

Designing robot-based games for individuals with autistic spectrum disorder

P. Chevalier

HMI, University of Twente, The Netherlands

Autism Spectrum Disorder (ASD) is described in the DSM-V by the difficulties in social interaction and communication and the presence of restricted and repetitive patterns of behaviours, interest or activities. Children with ASD showed an affinity for robot, computer and mechanical components, which has drawn the attention of Socially Assistive Robotics (SAR) researchers. Following this observations, robots have been used to enhance different skills in children with ASD, as social engagement, imitation and joint attention, with some encouraging results, including increased gaze toward the robot and increased number of smiles. However, the great inter-variability of the symptoms of children with ASD is yet not enough taken in consideration in SAR. Children with ASD suffer, alongside social skills impairments, of hyper and/or hypo-sensitivities to sensory inputs (audio, visual, touch, proprioception, ...). New approach in SAR for children with ASD should take these sensitivities in account while designing intervention with a robot. Indeed, in SAR, the robot should not be overwhelming by providing too many sensory inputs for the individuals with ASD. However, robots' embodiment may trigger pain or discomfort to the child with ASD interacting with it, as they can be graspable, moving and noisy (because of audio files or motor/fan noises).

Session

SYMPOSIUM - A failure to filter threat?: How bottom-up and top-down control processes contribute to the expression and regulation of fear and anxiety

Time: *Location:* **CZ-4**

Saturday, 21/Jul/2018:
8:30am - 10:10am

Organizer(s): **Carien M. van Reekum & Matthias J. Wieser**

The prioritisation of threat in bottom-up sensory processes has long been identified as a risk factor for anxiety. Similarly, dysregulation and generalisation of threat perception have been associated with a vulnerability to anxiety. The current symposium highlights new approaches in this research tradition, demonstrating how the anticipation and extinction of threat alter hypervigilance, how anxious disposition interacts with threat perception and regulation, and the extent to which attentional control can be exerted to filter out threat. In the first talk, Christian Panitz discusses how threat recall is associated with suppression of alpha power in posterior brain regions, which is resistant to extinction. Then, Matthias Wieser explores how the anticipation of social and bodily threat is associated with general hypervigilance and enhanced sensory processing -indexed by early modality-specific ERP components - during threat anticipation, depends on the type of threat. Using psychophysiological and neural indicators of threat learning, Carien van Reekum & Jayne Morriss demonstrate that intolerance of uncertainty leads to overgeneralisation in threat learning, and thus might be a potential risk factor for anxiety disorders. Christine Larson examines how functional plasticity in threat extinction and attentional control brain networks interacts with trait anxiety. Finally, Naz Derakhshan discusses how enhancing attentional control can lead to the regulation of threat bias. Altogether, the talks in this symposium underscore the role of threat expectancy in biasing vigilance and how such hypervigilance can be regulated through attentional control.

8:30am - 8:50am

Stimulus-evoked alpha power reduction in long-term conditioned fear

C. Panitz[1], A. Keil[2], E. M. Mueller[1]

[1]Psychology Department, University of Marburg, Germany; [2]Center for the Study of Emotion and Attention, University of Florida, USA

Stimulus-evoked alpha power reduction in the posterior EEG has been suggested to index increased receptivity of visual brain areas to external inputs. In line with prioritized processing of danger cues, inherently aversive pictures have been reported to evoke stronger reductions relative to neutral pictures. However, it has not yet been investigated if fear conditioned stimuli (i.e. stimuli with acquired aversiveness) also lead to such modulations of alpha power. Here, *N* = 87 male participants underwent differential fear conditioning with two neutral faces as CS+, two other faces as CS- and aversive noise bursts as US. Subsequently, one CS+ and one CS- were presented during an extinction phase, the other two CS were not. In a critical recall test 24h later, all CS were presented again. In the recall test, wavelet analysis at parieto-occipital electrodes revealed a strong and widespread relative alpha reduction for CS+ vs. CS-. This effect was independent of previous extinction training, i.e. both the extinguished and the non-extinguished CS+ showed comparable reductions in alpha power. In the present study, we show that alpha power at posterior sites is sensitive to associative learning processes and likely reflects intensified processing of visual fear stimuli. Moreover, conditioned reductions in alpha power appear to be stable across time and robust to extinction.

8:50am - 9:10am

Sensory processing and the anticipation of threat: Does threat modality, sensory modality, and type of anxiety matter?

M. J Wieser[1], P. Reicherts[2], G. Juravle[3], A. von Leupoldt[4]

[1]Erasmus School of Social and Behavioural Sciences, Erasmus University Rotterdam, Netherlands, The; [2]University of Würzburg, Germany; [3]Lyon Neuroscience Research Center, France; [4]University of Leuven, Belgium

The anticipation of threat is a key feature of anxiety and its related disorders. It is assumed that anticipation leads to hypervigilance for threatening information. However, it is still not fully explored whether this hypervigilance is threat-specific or general in nature. To this end, we investigated visual threat processing in high socially anxious, high anxiety sensitive, and non-anxious participants in an anticipation of shock and an anticipation of public speaking condition. During these phases of anxious anticipation, participants watched pictures of social and bodily threat, and neutral scenes. All participants exhibited enhanced visuo-cortical processing during threat anticipation. The findings were corroborated by higher ratings of arousal and unpleasantness for all pictures during threat anticipation with small hints of selectivity such that social threat pictures were rated as most arousing during anticipation of social threat. In line with previous findings, this study points at the notion that anticipation of threat may rather increase attention generally to incoming stimuli than specifically to threat-matching stimuli. This general effect was further explored in a second experiment, where ERP responses to neutral stimuli of three modalities (visual, auditory, somatosensory) were measured while participants anticipated threats presented in the three different modalities (aversive picture, aversive noise, aversive electrical stimulation). The N1 in response to somatosensory stimuli was modulated by threat modality: Only when a shock was anticipated, enhanced processing of non-aversive shocks was found. Overall, results pinpoint the notion of general hypervigilance during threat anticipation, which may however depend on the type of anticipated threat.

9:10am - 9:30am

Intolerance of uncertainty is associated with threat generalisation across psychophysiological and neural indices of aversive learning

J. Morriss, C. M van Reekum

School of Psychology and Clinical Language Sciences, University of Reading, United Kingdom

Attending to stimuli that share perceptual similarity to learned threats is an adaptive strategy. However, prolonged threat generalization to cues signalling safety is considered a core feature of pathological anxiety. One potential factor that may sustain over-generalization is sensitivity to future threat uncertainty. For example, during contexts where threat is uncertain, individuals who score high on self-reported Intolerance of Uncertainty (IU) may have difficulty discriminating between threat and safety cues. We sought to examine this question using a series of aversive learning experiments whilst recording electrodermal and neural activity. In experiments using simple fear extinction, we found that higher IU was associated with generalized responses in skin conductance and the amygdala to threat and safety cues, as well as delayed recruitment of the ventral medial prefrontal cortex to threat cues. In an experiment using a variant of fear acquisition and extinction where threat and safety cues varied in perceptual similarity, we found that higher IU was associated with generalized responding to threat and safety cues during acquisition, and delayed discrimination between threat and safety cues during extinction. The results from these experiments were specific to IU, over other measures of anxious disposition. These findings highlight: (1) a critical role of uncertainty-based mechanisms in threat generalization, and (2) IU as a potential risk factor and treatment target for anxiety disorders.

9:30am - 9:50am

Plasticity of fear extinction networks and relations with cognitive control in trait anxiety

C. Larson, D. Stout, E. Belleau

Psychology, University of Wisconsin-Milwaukee, United States of America

Fear extinction is a powerful model of fear inhibition and fear regulation problems are evident in those with anxiety. Extinction learning is dependent upon plastic interactions between the amygdala, anterior midcingulate cortex (aMCC), hippocampus, and ventromedial prefrontal cortex (vmPFC). Anxiety is also associated with impaired attentional control, including difficulties filtering task-irrelevant threat from entering working memory. We posit that poor attentional control over threat may lead to difficulties downregulating fear, including impaired fear extinction. However, the links between these two central anxiety-relevant constructs are not yet understood. We sought to address two questions. First, we examined pre- to post-extinction changes in resting state connectivity of fear inhibition and expression pathways and how trait anxiety was associated with extinction-related plasticity within these pathways. Second, we examined whether neural indices of poor attentional control and filtering of threat was associated with aberrant recruitment of extinction circuitry. We found that trait anxiety was associated with strengthening of connectivity within amygdala-aMCC circuits supporting the expression of fear following extinction learning. With respect to attentional control, trait anxious individuals failed to filter threat distracters from entering working memory, as evidenced by greater activation in working memory-load sensitive regions. Moreover, this neural index of poor attentional control was associated with greater vmPFC activation to both the CS+ and CS- during extinction, suggesting inadequate learning of safety cues. Our results highlight the role of aberrant extinction-related plasticity in a key fear expression pathway and the interplay of attentional control and extinction of fear in anxiety.

9:50am - 10:10am

Attentional control as a determinant of anxiety related vulnerability and resilience

N. Derakhshan
Birkbeck University of London, United Kingdom

An anxiety linked attentional bias has shown to correlate with emotional vulnerability. However, the origins of an anxiety linked attentional bias have proven difficult to determine. Guided by accumulating evidence in support of recent theoretical opinions, this talk will discuss how deficits in executive functions of working memory and attentional control can play a mediating role in the development and maintenance of an anxiety related attentional bias. Capitalising on developments in neuroscience that showcase neuroplasticity induced change as a result of interventions exercising cognitive control, this talk will discuss the potential promise of neurocognitive interventions in modulating anxiety linked attentional bias through boosting cognitive flexibility and processing efficiency. Implications for reducing emotional vulnerability and promoting resilience in a number of vulnerable populations are highlighted.

Session

Social attention

Time: **Saturday, 21/Jul/2018: 8:30am - 10:10am**

Location: **CZ-5**

Session Chair: **Cesco Willemse**

8:30am - 8:50am

Mutual gaze in combination with cue reliability influence gaze cueing effect

K. Kompatsiari[1,2], F. Ciardo[1], J. Perez-Osorio[1], A. Wykowska[1,3]
[1]Social Cognition in Human-Robot Interaction, Istituto Italiano di Tecnologia,Italy; [2]Ludwig-Maximilians-Universität München, Germany; [3]Luleå University of Technology, Sweden

The present work examined the effect of a real-time mutual gaze on a gaze-cueing effect (GCE). To this end, we developed a gaze-cueing paradigm with iCub humanoid robot as the main gaze cue provider and we manipulated iCub's gaze before the directional shift to be either oriented towards participants' eyes (mutual gaze) or down (avoiding gaze). In three experiments we manipulated the predictivity of gaze direction with respect to target location and the duration of the Stimulus-to-Onset Asychrony (SOA). In Experiment 1, iCub's gaze was non-predictive regarding target location (50% validity) and SOA was equal to 1000 ms, in Experiment 2 the gaze was also non-predictive but the SOA was 500 ms, while in Experiment 3, the gaze was counter-predictive (25% validity) and the SOA remained 500 ms. Results of Experiment 1 and 2 show that when reliability of the cue did not require strong top-down "strategic" control over orienting of attention (due to 50% validity), the "social" component (mutual gaze) modulated the GCE, but only in a longer SOA condition (Experiment 1: GCE only in mutual condition). In the short SOA condition, there was no difference in GCE between mutual and avoiding gaze. (Experiment 2: GCE in both conditions). Results of Experiment 3 show that when the cue reliability required suppression of the reflexive component (due to 25% validity), the "social" component suppressed GCE in mutual gaze. Our results suggest that the mutual gaze interacts with the gaze predictivity and the temporal dynamics of gaze-induced attentional orienting.

8:50am - 9:10am

Robots who follow the (gaze) leader: Studying joint attention with embodied agents and mobile eyetracking

C. Willemse, A. Wykowska
Social Cognition in Human-Robot Interaction, Istituto Italiano di Tecnologia, United Kingdom

Human gaze acts as a prominent signal to initiate joint attention with others. Additionally, being successful in gaze-leading positively affects engagement with a partner. Here, we firstly report a contingent eyetracking paradigm, in which participants expressed object preference by looking at one of two objects presented on a screen. Then, an avatar of a humanoid robot iCub either followed (joint attention) or unfollowed (disjoint attention) the participant's gaze. We found that return-to-face saccades toward the iCub who followed gaze were quicker than toward the unfollowing iCub, which indicates facilitated engagement. Participants also reported a greater likeability of the former robot. In a follow-up study we took advantage of using a robot in its embodied form, for the unique opportunity that embodiment provides to study this type of contingent behaviour in more naturalistic settings. In this mobile eyetracking study, participants selected one of two bottles with their gaze after which the iCub sitting opposite the participants looked at the same bottle (joint attention) or at the other one (disjoint attention). Again, we examined how this behavioural contingency influenced return-to-face saccades and attributions of likability, anthropomorphism, and theory of mind. Taken together, our findings show that successful initiation of joint attention affects social behaviour with artificial agents, as well as attributions made toward those agents. This work bears particular relevance to bridging the gap between laboratory settings and ecologically valid realistic situations. Furthermore, it exposes hints toward the engineering and design of our future robot companions.

9:10am - 9:30am

A top-down driven attention reduction mechanism in dyads sharing the locus of attention? Insights from functional connectivity in a dual-EEG study

J. C. Avendano Diaz, X. He
Department of Psychology, Bournemouth University, United Kingdom

It has been proposed that co-attending to the world with others could have a special importance for us, enhancing human performance in general (e.g.Shteynberg, 2015). However, this may not be always the case. Previous evidence has suggested that when two persons (a dyad) paid attention towards the same spatial location in a sustained visual attention task (dual-attention), the attention effect was reduced in reaction times (He & Avendaño Diaz, in prep.). Dual-EEG data recorded from 32 participants performing the same dual-attention task suggested that the attention effect was enhanced at the sensory level (P1-component), and that the reduced attention effect in behaviour was the outcome of a top-down cognitive control process (N2b-component) (He,Wang,& Avendaño Diaz, in prep). Moreover, time-frequency representations of power showed a typical reduction in the alpha-band activity (8-14Hz) over the posterior region contralateral to the attended location. This suppression, however, was significantly weaker around 200-350ms, when the dyads directed attention towards the same spatial location (attention-shared) than when their locus of attention differed (attention-not-shared).

Taking together the previous findings, we hypothesised that the attention reduction effect may be the results of an alpha-driven feedback process from prefrontal to parieto-occipital areas, reflected by a stronger functional connectivity between these two regions for the attention-shared condition, enhanced at contralateral sites. In line with this hypothesis, imaginary coherency and phase-locking-values showed an increased alpha-band connectivity between the regions of interest when the dyad shared the attended locations, adding more evidence towards a top-down driven attention reduction mechanism in dual-attention settings.

9:30am - 9:50am

Social inhibition of return: Believe it or not

O. Nafcha[1,2], S. Gabay[1,2], S. Shamay-Tsoory[1]

[1]Psychology, University of Haifa, Israel; [2]The Institute of Information Processing and Decision Making (IIPDM)

Understanding others' actions and intentions is important for successful adaptation to the environment. It has been suggested that when we observe another person's action toward a specific location, an inhibitory process is initiated toward that location. This effect has been termed Social Inhibition of Return (SIOR; Welsh et al., 2005). SIOR refers to slower reaction time (RT) toward a location already searched by another person. In a new computerized version of the basic paradigm, two participants performed the task together, sitting in front of a computer screen, facing each other. Each participant, in turn, responded to a peripherally presented target in two successive trials. The first trial was performed after the other participant responded and was aimed at examining SIOR. The second trial for each participant was aimed at studying the self-induced IOR, which refers to slower RT toward a location already searched by the individual. In the current study we aimed to examine whether merely believing that there is a partner would be a sufficient social cue to induce the SIOR effect. Accordingly, we examined two conditions. Under the first condition, participants performed the task alone. In the second condition, participants were made to believe that they were performing the task with a co-actor, only in separate rooms. Results demonstrated SIOR even though participants did not directly observed the co-actor's actions. Furthermore, there was no SIOR when the participants performed the task alone, under the same visual display.

9:50am - 10:10am

Brain synchronization during first time social interaction

G. Kedia[1], S. Fresnoza[1], C. Hutzinger[2], E. Jauk[3], A. Ischebeck[1], K. Corcoran[1]

[1]University of Graz, Austria; [2]Privatuniversität Schloss Seeburg, Austria; [3]Technische Universität Dresden, Germany

"Being on the same wavelength" may be more than a figure of speech. Recent research in social neuroscience suggests that people's brains can rhythmically oscillate with each other. In the present study, we investigated whether two persons who meet for the first time get into neural synchrony as they interact with each other. We ran an hyperscanning EEG study: We measured the similarity in brain oscillations of dyads of participants who had never met before and were asked to discuss moral dilemmas. Results indicated increasing phase-to-phase coherence in the theta range (EEG oscillations between 4-7 Hz) between the dyad members over the time of the interaction. Moreover, we found that this increase predicted the extent to which the two participants influenced each other in their attitudes towards the moral dilemmas. These results suggest that people's brain naturally couple during social interaction and that this process facilitates social influence.

Session

SYMPOSIUM - The Balance between You and Me: Integrating social, affective and embodied approaches to the self-other distinction

Time: **Saturday, 21/Jul/2018: 10:40am - 12:00pm**

Location: **CZ-1**

Organizer(s): **Aikaterini (Katerina) Fotopoulou, Louise P. Kirsch & Laura Crucianelli**

According to cognitive social neuroscience there are at least two ways of knowing yourself. One through integrating multimodal signals into an egocentric reference frame and assigning the first person perspective. Another through the cognitive ability to disengage from the embodied first person perspective and adopt another person's perspective (1st or 2nd) on your own experience. These research traditions have progressed with relative independence in the field. For example, one tradition uses simultaneous presentation of incongruent sensory signals (including interoceptive and exteroceptive signals) to study how people decide whether a body part is their own or another person's. A separate tradition uses simultaneous presentation of incongruent sensory signals (including emotional signals) to study how people distinguish between their own experience and that of another person's. The relation between these traditions is obvious, yet their findings have not been integrated. This symposium brings together experts from both traditions to address for the first time the self-other distinction at both embodied, affective and social levels. We will also consider whether these two levels are influenced by the same neurobiological mechanisms and can inform psychopharmacological interventions.

10:40am - 11:00am

Comfortable in our own skin: From body boundaries to self-other distinction

L. Crucianelli, L. P. Kirsch

Clinical, Educational and Health Psychology, University Colllege London, United Kingdom

We are in constant interaction with others, in a multisensory environment, where touch is an important component but often neglected. Tactile experiences can shape our bodily and emotional states. However, there is a lack of research investigating the role of touch in judging our own and other's affective states. In the first part, Dr Kirsch will describe a series of experiments using a new paradigm created to evoke different emotional states via tactile stimulation, in a self-other affective judgment task. Overall, results show a positive embodied egocentricity bias, suggesting that participants' tactile experience is influencing their judgement of others' experience. Moreover, galvanic vestibular stimulation increases this egocentric bias. We will discuss how these results can shed some lights on how we project ourselves into others, in tactile emotional contexts. In the second part, Dr Crucianelli will describe evidence highlighting how affective touch (i.e. gentle touch mediated by the C-Tactile system), and more generally interoception signals (i.e. information about the physiological condition of the body) may make a unique contribution to the sense of body ownership. From a neurobiological point of view, positive tactile experiences such as massages and hugging a loved one seem to be related to the release of a neuropeptide, oxytocin. We will describe experimental evidence

suggesting an impaired C-Tactile system in Anorexia Nervosa, an eating disorder characterised by restricting eating, body image concerns and social difficulties. We will discuss recent research investigating the effect of intranasal oxytocin on the perception of affective touch, interoception and body representation.

11:00am - 11:20am

Self-Other distinction in empathy is modulated by cTBS on right supramarginal gyrus and dispositional cognitive empathy: An rTMS/fMRI study

H. Bukowski[1], M. Tik[2], G. Silani[3], C. Ruff[4], C. Windischberger[2], C. Lamm[1]

[1]Social, Cognitive and Affective Neuroscience Unit, Department of Basic Psychological Research and Research Methods, University of Vienna, Vienna, Austria; [2]MR Center of Excellence, Center for Medical Physics and Biomedical Engineering, Medical University of Vienna, Austria; [3]Department of Applied Psychology: Health, Development, Enhancement and Intervention, University of Vienna, Vienna, Austria; [4]Laboratory for Social and Neural Systems Research, Department of Economics, University of Zurich, Zurich, Switzerland

Self-Other distinction (SOD) is a crucial mechanism in empathy regulating conflicts and preventing confusions between self-experienced emotions and those of others. The present study aimed to extend our current neurocognitive understanding of this mechanism. Thirty-one participants underwent a continuous theta burst rTMS protocol that transiently neuromodulated the supramarginal gyrus (rSMG), a previously identified sub-region of the temporoparietal junction involved in cognitive empathy (Silani et al., 2013), and the vertex, a control cortical site. Right after rTMS they completed a visuo-tactile empathy task in a MRI scanner. SOD performance was measured by changes in pleasantness judgments and brain activity between conditions where oneself and another person shared congruent emotional experiences and conditions where self-other emotional experiences were incongruent. SOD performance was enhanced following rTMS on the rSMG in comparison to vertex stimulation but this rTMS-induced enhancement of SOD was only observed in relation with lower dispositional cognitive empathy. An identical relationship was found with brain activity where an rTMS-induced reduction of rSMG activity during SOD was only observed in relation with lower dispositional cognitive empathy. Finally, the direction of the correlation between the rTMS-induced change during SOD and dispositional cognitive empathy was associated with two anatomically and functionally distinct networks. These findings yield new insights about the causal role of the rSMG in SOD in empathy and uncover a novel perspective on how rTMS affects high-level cognition.

11:20am - 11:40am

Self-other blurring: A two-brain approach for understanding how empathy contributes to distress regulation

S. Shamay-Tsoory

Psychology, University of Haifa, Israel

Empathy allows us to understand and share one another's emotional experiences. Despite the developments in the study of empathy, the vast majority of empathy paradigms focus only on passive observers, carrying out artificial empathy tasks in socially deprived environments. This approach significantly limits our understanding of interactive aspects of empathy and how empathic responses affect the distress of the sufferer. We recently proposed a brain model that characterizes how empathic reactions alleviate the distress of a target. Specifically, in a dual-EEG study we show that hand-holding during pain administration increases brain-to-brain coupling in the alpha-mu band in a network that mainly involves the central regions of the pain target and the right hemisphere of the empathizer. Moreover, brain-to-brain coupling in this network was found to correlate with analgesia magnitude, indicating that brain-to-brain coupling may contribute to touch-related analgesia. Similarly, using a serial dual-fMRI approach we show that empathy related activations (anterior cingulate, insula) in the empathizer predict pain related activations in the sufferer during hand-holding. Employing this dual-brain approach may provide a highly controlled setting in which to study the neuroanatomical bases of real-life empathy and its contribution to distress regulation.

11:40am - 12:00pm

Peripersonal space defines as self-other boundary during social interactions

A. Serino

Department of Clinical Neurosciences, University Hospital Lausanne, Switzerland

Our brain has developed a specific system to represent the space closely surrounding the body, termed peripersonal space (PPS), which has a key functional role, as it is were all physical interactions with stimuli in the environment occur. Previous works focus on PPS as a multisensory-motor interface where tactile stimuli on the body are integrated with visual or auditory information related to external objects close to the body, in order to mediate body-objects interactions. Our and other groups have shown that PPS is dynamic, in that it adapts depending the on the context and the properties of external stimuli. PPS is also plastic, in that it extends to incorporate farther portions of space, once the individual has interacted with them, (e.g., with tools), or it contracts, if interactions are limited because of external constraints, body or brain injury. In this talk, I will focus on more abstract forms individual-environment interactions, that is those involving other people. I will show how PPS accommodates in the presence of other individuals, and further specifies, as a function of how the others are perceived or behave. Finally, individual personality traits, and in particular those relevant for social interactions, such as dominance, empathy and attachment, also characterize PPS representations. Thus, I will propose that PPS, which originally develops as a multisensory-motor representation of the action space, also mediates higher-level, idiosyncratic forms of self-other interactions.

Session

Autism

Time: **Saturday, 21/Jul/2018: 10:40am - 12:00pm**

Location: **CZ-2**

Session Chair: **Eleanor Rose Palser**

10:40am - 11:00am

Differences in the bodily representation of emotion and interoception in autism and typical development

E. R Palser[1,2], A. Galvez-Pol[2], E. Pellicano[3], A. Fotopoulou[1], J. M Kilner[2]

[1]Clinical, Health and Educational Psychology, University College London (UCL), United Kingdom; [2]Institute of Neurology, Uvinversity College London (UCL), United

Kingdom; [3]Department of Educational Studies, Macquarie University, Australia

The perception of the physiological condition of the body, or interoception, has long been considered of importance for understanding emotion. It is now known that emotions are associated with discrete bodily maps of where they are experienced (Nummenmaaa et al., 2014), these maps become more differentiated throughout child development (Hietanen et al., 2016), and that their differentiation is related to interoceptive processing (Jung et al., 2017). Difficulties in emotions processing are considered an integral part of autism. Here, we sought to investigate if there are differences in the bodily representation of emotion in autism, compared with typical development, and if so, do these differences relate to interoceptive processing. Participants comprised 79 children and adolescents (6-19 years), 39 of which had a diagnosis of an autism spectrum condition and 40 of which were typically developing. These groups were matched for chronological age and IQ. The Embody emotion coloring task (Nemmenmaa et al., 2014) was used to measure the bodily representation of seven emotions and interoceptive accuracy was gauged using the heartbeat tracking task (Schandry, 1981).We found significant differences in how emotions are embodied between typical development and autism ($t(77)=2.425$, $p=0.018$) and these group differences remain after controlling for age, gender and IQ. Further, interoceptive accuracy significantly explains more variance in the bodily representation of emotion, over and above group membership. Autistic children and adolescents show significant differences in how they report the bodily sensations associated with emotions. These data suggest one possible cause of these differences is reduced interoceptive accuracy.

11:00am - 11:20am

Autism and interoception: A fragmented internal world

T. R. Hatfield, R. Brown

The Research School of Psychology, The Australian National University, Australia

Autism Spectrum Disorder (ASD) is associated with atypical functioning across multiple sensory modalities. Although difficulties in the perception of internal bodily sensations (i.e. interoception) can be inferred from the first clinical descriptions of ASD (Kanner, 1943), research to date has primarily focused on external sensory processing. In fact, only in the past 6 years have researchers sought to empirically examine the way in which people with ASD attend to and process internally-derived signals. While the contemporary studies have made some progress in examining the subjective, objective, and metacognitive aspects of interoception in ASD, the relationship between ASD status and interoceptive dysfunction is still unclear. Furthermore, the results of these studies were evaluated without consideration of the available neuropsychological frameworks for the perceptual processing of people ASD. In this presentation, we suggest that the *Weak Central Coherence* (WCC) framework (Frith, 1989) may offer useful insights into the manner in which interoception operates at the perceptual level in people with ASD. In particular, this conceptualisation of interoception in ASD posits that people with the disorder may demonstrate a reduced capacity to integrate local interoceptive information into coherent global feeling states (Hatfield, Brown, Giummarra, & Lenggenhager, 2017). Crucially, a potential corollary of this impairment is uncertainty in the interpretation of emotions and other feeling states in self and others. While the established methodological approaches to measuring interoception might frustrate the implementation of such a local–global approach, we suggest that data from novel topographical approaches to sensation reporting might overcome the challenges.

11:20am - 11:40am

Ability to imitate emotional facial expressions is unrelated to empathy and emotion: Implications for autism and perception-action links.

C. F. Huggins, J. Williams, I. Cameron

Institute of Medical Sciences, University of Aberdeen, United Kingdom

Previous studies have found that trait empathy predicts greater accuracy when imitating emotional facial expressions. This may be as decoding facial expressions, a key component of empathy, is underpinned by perception-action links, which suggest that perceiving another's facial expression triggers congruent motor plans and representations of its associated emotional state. The current study aimed to replicate this association between imitation and empathy with more quickly presented stimuli, as well as examine this relationship in the context of individual differences in emotion and autistic traits. 61 undergraduate students imitated facial expressions presented for three seconds each. Imitative attempts were coded for accuracy by blind raters through a matching paradigm. To assess emotional intensity, participants rated twenty images from the Nencki Affective Picture System by how intensely they elicited ten target emotions. Empathy and autistic traits were assessed through self-report. In contrast to previous studies which presented facial stimuli for ten seconds, the current study found no correlation between empathy and imitation accuracy. Furthermore, no association emerged between imitation accuracy and subjective emotional experience or autistic traits. Autistic traits were associated with significantly less differentiation between negative emotional states. While imitation of faces presented for long periods may be predicted by trait empathy, the imitation of briefly-presented facial stimuli is unaffected by empathy, autistic traits, or individual differences in emotion. This has implications for the role of perception-action links in empathy, and evidences that the ability to imitate facial expressions in social interactions may not be associated with autism, empathy, or emotion.

11:40am - 12:00pm

Neural components of attention to own name as a social cue in young infants at low and high risk for Autism Spectrum Disorder

M. Arslan, P. Warreyn, N. Dewaele, J. R. Wiersema, E. Demurie, H. Roeyers

Department of Experimental, Clinical and Health Psychology, Ghent University, Belgium

The own name is a salient stimulus, often used by others to initiate and engage in social interaction. Typically developing infants start to orient towards the sound of their own name already at 4-5 months of age. Lack of orientation to the own name is considered as one of the earliest signs of autism spectrum disorder (ASD). Enhanced attention to the own name is important for language acquisition and the development of socio-cognitive skills. Consequently, a reduction of attention to this social cue may result in weakened early social information processing, interfering with the development of social and language skills. We aimed to identify the neural patterns of two infant groups at low-risk(LR) and high-risk(HR) for developing ASD, at 10(n=60) and 14(n=68) months of age, while they were hearing their own name versus a stranger's name, each followed by object presentations, representing attention allocation based on this social cue. The preliminary results of auditory ERPs suggest that LR infants discriminated and paid more attention to their own name compared to stranger name by the age of 10 months; yet the differences between the groups were identified more clearly by the age of 14 months. These results imply that HR infants become

differentiated from LR infants by their brain development around one year of age with respect to paying attention to their own names. At the conference the results of both auditory and visual ERPs will be presented and discussed in the context of the own name as a social cue.

Session

Social cognition II

Time: *Location:* **CZ-3**

Saturday, 21/Jul/2018:
10:40am - 12:00pm

Session Chair: **Georgia Stephanou**

10:40am - 11:00am

Modulation of behavioral and brain responses to visual perspective taking by social rejection: Evidence from electrophysiology

S. Peng[1,2], Y. Leng[1,2], H. Deng[1,2], S. Ge[1,2]

[1]School of Biomedical Science and Medical Engineering, Southeast University, China, People's Republic of; [2]Key Laboratory of Child Development and Learning Science, Southeast University, China, People's Republic of

Visual perspective taking (VPT) is crucial for reasoning about other people's mental states. To explore the modulation of behavioral and neural responses to visual perspective taking by social rejection, we firstly manipulated rejection using get-acquainted oral communication and a two-person visual perspective task, then explored how the experience of social rejection affected the behavioral and neural responses during the follow-up classical one-person visual perspective task. The subjective rating and behavior results showed that social rejection increased individuals' negative affect level and feelings of need-threat, decreased self-regulation and impulsive control. The event-related potentials (ERP) and standardized low resolution brain electromagnetic tomography (sLORETA) results mainly showed that the increased parietal LSW indexing perspective taking showed greater activities in SPL and rTPJ after social rejection. Moreover, the left LFW of socially rejected group showed more positive amplitude for other-inconsistent condition than that for other-consistent condition. These results suggested that social rejection might decrease impulsive control behaviorally, as well as increase neural processing of perspective taking. Our findings provide powerful evidence on neural mechanism underlying how social rejection modulates visual perspective taking, and support the model of social monitoring system, in that socially rejected individuals motivate to attend more carefully to social cues, such as other people's perspective.

11:00am - 11:20am

Age differences in prosocial influence

L. Foulkes[1,2], J. Leung[2], D. Fuhrmann[2,3], L. Knoll[2], S.-J. Blakemore[2]

[1]Department of Education, University of York, United Kingdom; [2]UCL Institute of Cognitive Neuroscience, London, United Kingdom; [3]MRC Cognition and Brain Sciences Unit, Cambridge, United Kingdom

Social influence occurs when an individual's thoughts or behaviours are affected by other people. There are significant age effects on susceptibility to social influence, typically a decline from childhood to adulthood. Most research has focussed on negative aspects of social influence, such as peer influence on risky behaviour, particularly in adolescence. The current study investigated the impact of social influence on the reporting of prosocial behaviour (any act intended to help another person). In this study, 755 participants aged 8-59 completed a computerised task in which they rated how likely they would be to engage in a prosocial behaviour. Afterwards, they were told the average rating (in fact fictitious) that other participants had given to the same question, and then were asked to rate the same behaviour again. We found that participants' age affected the extent to which they were influenced by other people: children (8-11 years), young adolescents (12-14 years) and mid-adolescents (15-18 years) all significantly changed their ratings, while young adults (19-25 years) and adults (26-59 years) did not. Across the three youngest age groups, children showed the most susceptibility to prosocial influence, changing their reporting of prosocial behaviour the most. The study provides evidence that younger people's increased susceptibility to social influence can have positive outcomes.

11:20am - 11:40am

Social problem-solving ability and forgiveness in interpersonal relationships: Effects on attributions and emotions

G. Stephanou

Early Childhood Education, University of Western Macedonia, Greece

The primary aim of this study was to examine the role of forgiveness and social problem-solving ability in teachers' attributions and emotions for the subjectively estimated quality of their interpersonal relationships with their colleagues. Attributions and emotions for the same relationships were also investigated. The participants were 250 teachers, both genders, aged from 25 to 58 years. The main results showed that (a) the estimated satisfactory and bad relationships were in the most ascribed to self- and others- related factors, respectively, (b) the perceived as good than bad interpersonal relationships were associated with more intense positive emotions, (c) both greater forgiveness and higher social problem-solving ability predicted a better quality of interpersonal relationships, and subsequent optimistic attributional pattern and positive emotions, whereas a lack of forgiveness and low social problem-solving created more bad relationships and stirred up maladaptive attributions and negative emotions, (d) social problem-solving ability most influenced causal thought and emotions in the perceived bad interpersonal relationships, while forgiveness was a more powerful predictor in the estimated as good relationships and (e) a high level of social problem-solving ability seemed to help teachers to forgive and, consequently, have more fulfilling interpersonal relationships with their colleagues. The findings are discussed regarding the enhancement of the psychological well-being of teachers, and the future research.

11:40am - 12:00pm

The role of the anterior insula in social norm compliance and enforcement: Evidence from coordinate-based and functional connectivity meta-analyses

G. Bellucci[1], C. Feng[2], J. Camilleri[3], S. B. Eickhoff[3], F. Krueger[4]

[1]Department of Psychology, University of Lübeck, Germany; [2]State Key Laboratory of Cognitive Neuroscience and Learning, Beijing Normal University, China; [3]Institute for Neuroscience and Medicine (INM-1, INM-7), Research Center Jülich, Germany; [4]School of Systems Biology, George Mason University, USA

Economic games —trust (TG) and ultimatum game (UG)— combined with fMRI have shown the importance of the anterior insula (AI) in social normative behaviors. However, whether different AI subregions are engaged in different cognitive and affective processes for social norm compliance and norm enforcement during social exchange remains elusive. Here, we investigated the role of the dorsal AI (dAI) and ventral AI (vAI), combining a coordinate-based meta-analysis of fMRI studies using the TG and UG with meta-analytic task-based and task-free connectivity analyses. Our findings showed that the right dAI and vAI were the only common brain regions consistently activated across games. These clusters were part of two functionally distinguishable connectivity networks associated with cognitive (dAI) and emotional (vAI) processes. In conclusion, we propose that dAI mediates cognitive processes that generate expectancy for norm compliance, whereas vAI mediates aversive feelings that generate motivation to norm enforcement. The identified functional differentiation of the right AI in the social domain contributes to a better understanding of its role in basic and clinical neuroscience.

Session

Attention

Time: **Saturday, 21/Jul/2018: 10:40am - 12:00pm**

Location: **CZ-5**

Session Chair: **Louisa Kulke**

10:40am - 11:00am

Early neural mechanisms of overt attention

L. Kulke[1,2], A. Schacht[1,2]

[1]Affective Neuroscience and Psychophysiology, Georg-August University Göttingen, Germany; [2]Leibniz Science Campus Primate Cognition

Salient and emotional objects often attract our attention and draw our gaze towards them. However, most previous EEG studies investigated *covert* attention shifts by instructing participants to suppress natural eye-movements, leaving the neural time course of overt attention shifts yet unclear. This set of studies combined eye-tracking and EEG to measure *overt* shifts of attention in a gaze-contingent attention paradigm. Study 1 directly compared neural mechanisms of covert and overt attention shifts. Twenty-four participants either manually responded to peripheral targets while maintaining fixation (covert shift) or made a saccade towards them (overt shift). Posterior event-related potentials were comparable for overt and covert shifts of attention, suggesting that similar neural mechanisms are involved in both. However, an early fronto-central response differed between conditions, potentially reflecting saccade suppression during covert attention shifts. Therefore, overt measures may provide a clearer picture of more natural attention shifts, complementing previous findings. Study 2 compared overt shifts in the presence or absence of a competing stimulus in 41 participants. Eye-movement latencies towards peripheral targets were significantly shorter when no competing stimulus was present. The same latency pattern occurred for an early occipital response, suggesting that already very early ERPs can be related to subsequent overt shifts of attention. Study 3 additionally introduced emotional faces as stimuli to investigate effects of valence on attention shift latencies. The results shed light on early neural responses related to overt attention shifts, providing further information regarding the brain mechanisms underlying our attentional attraction towards emotional and salient stimuli.

11:00am - 11:20am

Early contribution of FEF in orienting attention to faces: A TMS-EEG study

S. Torriero[1], G. Mattavelli[1], E. Lo Gerfo[2], L. J. Romero Lauro[1], R. Actis-Grosso[1], P. Ricciardelli[1]

[1]Department of Psychology, University of Milan Bicocca, Italy; [2]Department of Economics, Management and Statistics, University of Milan Bicocca, Italy

The role of distinct cortical regions in guiding social orienting needs further investigation. Our aim was to explore the contribution of the frontal eye field (FEF) in early orienting of attention toward stimuli with a social value. We used a TMS-EEG approach to investigate the neurophysiological correlates of attentional orienting during the cueing phase of a modified version of the dot-probe task, comparing competing (emotional face vs. house) and not competing (house vs. house) conditions. Our results reveal increased amplitude of ERP components in the competing condition, showing greater posterior N170 and centro-frontal vertex positive potential (VPP) and an enhanced frontal negative component at 250-270 msec from cue onset. A reduced positivity at 400 ms was shown when face appeared on the left vs. right side of space. TMS pulses over FEF induced a similar and amplified N170/VPP complex, which in addition correlated with the performance at the behavioural attentional task. Interestingly, the perturbation of FEF induced lateralized effects on N170 dependent on the side of face presentation. These findings support the role of FEF in early face processing and subsequent attentional bias.

11:20am - 11:40am

Attentional and immunological adaptations to acute psychsocial stress

T. Kleinsorge[1], M. Claus[2], C. Watzl[2], V. Maydych[1]

[1]Psychology & Neuroscience, Leibniz Research Centre for Working Environment and Human Factors, Germany; [2]Immunology, Leibniz Research Centre for Working Environment and Human Factors, Germany

We explored attentional and immunological adaptations to psychological stress. To this end, two groups of participants were exposed either to a laboratory stressor (a variant of the Paced Auditory Serial Addition Test (PASAT), combined with social-evaluative stress) or a control activity. Subsequently, an emotional variant of the Attentional Network Test (E-ANT) was administered. Furthermore, participants' saliva was sampled three times and analyzed for concentrations of a number of cytokines and interferon. Compared to the low-stress condition, high stress was associated with increased levels of the cytokines IL-1β and IL-6. Furthermore, increases of a number of immunological parameters were affected by differences in the efficiency of attentional networks as indicated by ANT scores. These attentional modulations of immunological reactivity were most pronounced with negatively valenced stimuli presented as either cues or targets. These observations suggest that increased immunological responses to psychosocial stress are mediated by biased processing of negative information.

11:40am - 12:00pm

Visual and acoustic distraction in simulated car driving with young and older drivers

M. Karthaus, E. Wascher, S. Getzmann

Ergonomics, Leibniz Research Centre for Working Environment and Human Factors, Germany

While driving a car many acoustic and visual distraction stimuli appear. Some of them carry important information

for the driving task itself and have to be respond to, whereas others are irrelevant and have to be ignored. Especially in very complex or critical situations it is extremely important to focus only on the driving task and to inhibit irrelevant stimuli and inappropriate responses. Inhibition, however, decreases with increasing age. The present driving simulator study investigated the effects of acoustic and visual distractor stimuli on the response to critical events in 20 younger and 20 older drivers. They had to keep a virtual car on the lane and press the braking pedal, whenever the brake lights of the car in front of them flashed up, under different distraction conditions. While lane-keeping generally did not differ between the two age groups, we found significant differences in braking behavior: Older drivers showed higher braking response times and more braking errors (brake omissions, false alarms), especially in difficult task conditions with visual distractor stimuli. Moreover, both groups showed the highest braking response time in trials with additional visual distractors that have to be ignored. Event-related potentials reflecting the cognitive processing (P3) of relevant driving stimuli (brake light) support the behavioral data: The P3 decreased with task difficulty (i.e., in the presence of distractor stimuli that have to be ignored) and in higher age. Results are discussed within the framework of the model of multiple resources and age-related inhibition deficit hypothesis.

POSTER SESSION II

Time: **Saturday, 21/Jul/2018: 12:00pm - 1:30pm**

Location: **Boerhaaveplein**

P2-01 The role of trait rumination in reward anticipation and consumption

N. Kocsel[1,2,3,4], E. Szabó[1,2,8], A. Galambos[1,2,8], A. E. Édes[3,4], D. Pap[4], R. Elliott[5,6], L. R. Kozák[7], G. Bagdy[4,8], G. Juhász[3,4,5,6], G. Kökönyei[2,3,4]

[1]Doctoral School of Psychology, Eötvös Loránd University, Budapest, Hungary; [2]Institute of Psychology, Eötvös Loránd University, Budapest, Hungary; [3]SE-NAP2 Genetic Brain Imaging Migraine Research Group, Semmelweis University, Budapest, Hungary; [4]Department of Pharmacodynamics, Faculty of Pharmacy, Semmelweis University, Budapest, Hungary; [5]Neuroscience and Psychiatry Unit, University of Manchester, Manchester, UK; [6]Manchester Academic Health Sciences Centre, University of Manchester, Manchester, UK; [7]MR Research Center, Semmelweis University, Budapest, Hungary; [8]MTA-SE Neuropsychopharmacology and Neurochemistry Research Group, Hungarian Academy of Sciences, Semmelweis University, Budapest, Hungary

Recent work with remitted depressed patients has indicated that enhanced rumination tendencies distort brain mechanisms of anticipatory processes associated with reward and loss cues. The aim of the present study was to explore the impact of trait rumination on neural activity during reward and loss anticipation/consumption among never-depressed people. Thirty-seven (15 males, mean age±SD:25.92±4.18) healthy volunteers were included in the present study. Participants underwent one functional magnetic resonance imaging (fMRI) session while performing the monetary incentive delay (MID) task. Blood-oxygenation-level-dependent (BOLD) activity in the left inferior frontal gyrus (IFG) triangularis, left anterior insula, and left rolandic operculum was positively correlated with Ruminative Response Scale (RRS) scores. We did not detect any significant rumination-related activations yielded for win-neutral/loss-neutral cues and with reward/loss consumption. Our results highlight the influence of trait rumination on reward anticipation in a non-depressed sample indicating that for never-depressed ruminators rewarding cues are more salient than loss cues. Neural response during reward consumption did not relate to rumination, suggesting that rumination mainly relates to processing of the motivational (wanting) aspect of reward rather than the hedonic (liking) aspect, at least in the absence of pathological mood.

P2-02 Altered perception-action binding modulates inhibitory control in Gilles de la Tourette syndrome

V. A. Petruo[1,2], B. Bodmer[1,2], V. Brandt[3], L. Baumung[4], V. Roessner[2], A. Münchau[4], C. Beste[1,2]

[1]TU Dresden, Kognitive Neurophysiologie; [2]TU Dresden, Kinder- und Jugendpsychiatrie; [3]Universität zu Lübeck, Department of Paediatric and Adult Movement Disorders and Neuropsychiatry; [4]Universität zu Lübeck, Institut für Neurogenetik

Gilles de la Tourette Syndrome is a multi-faceted neuropsychiatric developmental disorder with onset in childhood or adolescence and frequent remissions in early adulthood. A rather new emerging concept of this syndrome suggests that it is a disorder of purposeful actions, in which sensory processes and their relation to motor responses (actions) play a particularly important role. Thus, this syndrome might be conceived as a condition of altered 'perception action binding'. In the

current study, we test this novel concept in the context of inhibitory control. We examined N=35 adolescent Gilles de la Tourette patients and N=39 healthy controls in a Go/Nogo-task manipulating the complexity of sensory information triggering identical actions; i.e. to inhibit a motor response. This was combined with event-related potential recordings, EEG data decomposition and source localization. Gilles de la Tourette patients showed worse performance compared to controls and larger performance differences when inhibitory control had to be exerted using uni-modal visual compared to bi-modal auditory-visual stimuli. This suggests increased binding between bimodal stimuli and responses leading to increased costs of switching between responses instructed by bi-modal and those instructed by uni-modal stimuli. The neurophysiological data showed that this was related to mechanisms mediating between stimulus evaluation and response selection; i.e. perception-action binding processes in the right inferior parietal cortex (BA40). Conclusions: Stimulus-action inhibition binding is stronger in GTS patients than healthy controls and affects inhibitory control corroborating the concept suggesting that GTS might be a condition of altered perception-action integration (binding); i.e. a disorder of purposeful actions.

P2-03 Can poor empathic skills be explained by cognitive flexibility deficits in depression?

K. El Bouragui[1,2], M. Rossignol[1], C. Besche-Richard[2]

[1]Cognitive Psychology and Neuropsychology, University of Mons, Belgium; [2]Cognition, Health and Society (C2S), EA 6291, University of Reims Champagne-Ardenne, France

Cognitive theories posit that depression could be characterized by cognitive flexibility deficits. Furthermore, studies showed poorer empathic skills in depression. As functional empathy requires to switch from self to others perspective, the purpose of this study is to investigate the role of mental flexibility in empathic deficits. To this aim, we recruited a sample of 30 young women, aged 18 to 25. To assess behavioral affective empathy (AE) and cognitive empathy (CE), participants performed the Multifaceted Empathy Test (MET), which consists of photographs depicting people in emotionally charged situations. Subjects had to rate pictures' valence, protagonists' emotional states and their level of compassion toward these. Afterwards, participants completed a local-global task measuring cognitive flexibility. In the emotional condition, happy and sad faces where displayed behind local and global forms, whereas no faces appeared in non-emotional condition. Results showed that subjective empathy (Basic Empathy Scale, 2008) was negatively correlated with depression (Beck Depression Inventory-II, 1996). Performances at the MET task revealed better recognition for negative emotions (specially sadness) in higher levels of depression. The cognitive task highlighted flexibility deficits in participants with higher levels of depression in the non-emotional condition and when they were processing happy faces. Furthermore, they performed better when processing sad faces in the local condition, while worse scores were obtained in the global one. Thus, depression seems to reduce flexibility and influence empathy. The partial role of mental flexibility in empathic skills through the ability to switch from its own perspective to one another will be discussed.

P2-04 Acting on observed social exclusion and pro-social behaviour in Autism Spectrum Disorders

C. Silva[1,2], C. Jover[3], F. Esteves[1,4], D. Da Fonseca[2,3], C. Deruelle[2]

[1]Instituto Universitário de Lisboa (ISCTE-IUL), Cis-IUL, Portugal; [2]Institut de Neurosciences de la Timone (INT), France; [3]Service de Pédopsychiatrie, APHM, France; [4]Mid Sweden University, Sweden

Humans are intrinsically motivated to prosociality. Using a novel adaptation of the Cyberball paradigm, we investigated subsequent pro-social behaviour after witnessing social exclusion of another in individuals with autism spectrum disorders. Participants played and witnessed a series of Cyberball games, rated their affective state, and completed an approachability rating of faces task. Findings showed that while all participants were aware of the social exclusion, only neurotypically developing participants engaged in pro-social behaviour. Participants with autism showed to be impassive, with no alterations in behaviour or in the affective state. Findings are discussed within the framework of an altered motivation assigning the reward value of social stimuli in autism, which may hinder the occurrence of actual behaviour in a social context.

P2-05 Is the cerebellum linked to the Theory of Mind alterations in autism? A direct comparison between patients with cerebellar damage and subjects with autism spectrum disorder.

S. Clausi[1,2], M. Lupo[1], G. Olivito[1,2,3], F. Laghi[4], L. Siciliano[1,5], R. Baiocco[4], M. Bozzali[3], M. Masciullo[6], M. Molinari[7], M. Leggio[1,2]

[1]Ataxia Lab, IRCCS Santa Lucia Foundation, Rome, Italy; [2]Department of Psychology, "Sapienza" University of Rome, Italy; [3]Neuroimaging Laboratory, IRCCS Santa Lucia Foundation, Rome, Italy; [4]Department of Developmental and Social Psychology, "Sapienza" University of Rome Italy; [5]PhD Program in Behavioral Neuroscience, 'Sapienza' University of Rome, Italy; [6]SPInal REhabilitation Lab (SPIRE), IRCCS Santa Lucia Foundation, Rome, Italy; [7]Robotic Neurorehabilitation Lab, IRCCS Santa Lucia Foundation, Rome, Italy

Recently, structural and functional alterations of the cerebellum have been related with Autism Spectrum Disorder (Fatemi et al, 2012). Moreover, a Theory of Mind (ToM) impairment, the main behavioural hallmark of ASD (Baron-Cohen, 1995), has been described also in patients affected by Spino-Cerebellar Ataxia (Sokolovsky et al, 2010). In this context, the present study was aimed at deeply investigating the role of the cerebellum in the ToM, boosting the hypothesis that cerebellar dysfunction could subtend the mentalizing difficulties reported in subjects with ASD. A ToM battery that included the Reading the Mind in the Eyes task (Baron-Cohen et al, 2001); the Emotion Attribution task (Blair & Cipollotti, 2000), and the Faux Pas test (Stone et al, 1998) was administered to 27 subjects with cerebellar atrophy (CB), 16 adults with ASD without language and intellectual impairments (following the DSM-V), and 62 typically developing adults (TD). 3D-T1 weighted scans were collected and a voxel-based morphometry analysis was performed to characterize the cerebellar structural alteration in the two cohorts. The results evidenced that the CB and ASD subjects showed a similar ToM profile with a significantly worse performance than TD in all the ToM tasks. The VBM analysis showed patterns of cerebellar alteration in CB and ASD subjects that have been related to the ToM performance. These data provide a first direct comparison between the ToM profile of patients with cerebellar damage and subjects with ASD and support the evidence of a specific cerebellar contribution in ToM alteration that characterizes the autism.

P2-06 Neuroticism effects on the valence of affect and depression. A serial mediation analysis on the levels of attentional and judgemental processing of emotional information

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The mediating role of processing strategies at the attentional and judgmental levels in the relationship between the Neuroticism and the valence of affect was tested. Strategies at the attentional level were indexed as careful searching (omissions rate) and impulsive searching (false alarms rate). Strategies at the judgmental level were indexed as the declarative use of cognitive emotion regulation strategies. Emotional Faces Attention Test and EPQ-R, PANAS-X, BDI, CERQ were completed by 916 participants. Analysis of serial mediation showed that only careful processing of joy and sadness (attentional level) and the use of catastrophizing, rumination, putting into perspective and attention refocusing (judgmental level) operated as independent as well as serial mediators of the relationship between the Neuroticism and affect. Results might suggest that Neuroticism is associated with the careful processing of facial sadness at the attentional level, that is further processed and strengthen, at the judgmental level, by rumination or catastrophizing, and it subsequently leads to an increased intensity of experiencing the negative affect. Interestingly, in relation to positive affect, Neuroticism is related to careful processing of facial joy, which is further processed, at the judgmental level, by the adaptive strategies (putting into perspective and attention refocusing); however, the negative relation between Neuroticism and those adaptive judgmental strategies finally reduced the effect of careful processing of joy on positive affect. The findings may potentially contribute to the discussion on clinical interventions such as attentional training and metacognitive control over the way of information processing among people affected by mood disorders.

P2-07 The serotonin transporter polymorphism moderates the influence of negative life events on depression in adolescents

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The development of depression is thought to be dependent on multiple factors, including the experience of negative life events and inherent characteristics, such as genetic variants. Crucially, it is the interaction between genes and the environment (GxE) which can explain why some people cope with negative experiences better than others. The serotonin transporter polymorphism (5HTTLPR) has been shown to moderate the influence of the environment on depression risk across multiple studies, often finding that the S allele confers some increased risk for depression with increasing levels of negative life events. However, the replicability of this effect has been debated creating controversy in the literature, with some arguing that positive results may be artefacts of underpowered studies. We present data from a large longitudinal study (CogBIAS-L-S) including 504 adolescents at Time 1 (age 12) and 449 at Time 2 (age 14). Moderated regression analysis revealed that negative life events in the preceding 12 months predicted depression, 5HTTLPR had no effect overall, but there was an interaction between 5HTTLPR and negative life events. Follow-up analyses revealed that S/S carriers were most affected by negative life events predicting depression (beta=.70, p<.001) and that L/L carriers were unaffected (beta=.20, p=.11). This supports the idea that the S allele increases sensitivity to the environment and depression risk. Future studies using multiple gene designs will be discussed.

P2-08 Rumination and violated expectation of pain: An fMRI study

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Detection of a mismatch between the expected and experienced aversive stimulus is essential for overriding existing beliefs which exert their effects in a top-down manner. Lack of detection of violated expectation may also prevent therapeutic change as well. So exploring factors that may deteriorate the detection of violated expectation are warranted. Based on clinical observations and studies on set-switching difficulties, we hypothesized that rumination – a stable tendency to focus repetitively on feelings related to distress – would be associated with the impaired detection of violated expectation. In the present study, fMRI data on a fear conditioning paradigm with pain as the unconditioned stimulus in 30 healthy subjects were analysed. Different visual cues predicted non-painful and painful relatively short electric stimuli delivered to the dorsum of the right hand. A partial-reinforcement schedule was chosen to have trials in which pain cue was not followed by painful stimulus (violated expectations trials). Rumination was assessed with the 10-item Ruminative Response Scale. Interestingly, with violated expectation (when an unexpected, non-painful stimulus follows a pain cue compared to when an expected, painful stimulus follows the same pain cue) a negative association between rumination and activation in posterior cingulate cortex – considered to be responsible for change detection in the environment and subsequent behavioural modification – was found. Our findings extend existing theories on altered information processing in rumination to the perception of unexpected omission of negative stimulus. Adverse effects of rumination on mental and physical health might be (partially) due to this altered process.

P2-09 Computational architecture of emotion coherence in Frontotemporal dementia

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Frontotemporal Dementia (FTD) is an umbrella term to describe a younger onset dementia with clinical presentations associated with progressive neurodegeneration of the frontal and temporal brain regions. Clinical presentation varies but generally categorised as in behavioural variant of FTD (bvFTD), or two presentations where language problem is the primary feature: semantic dementia (SD) or progressive non-fluent aphasia (PNFA) (Mesulam, 2001; Snowden et al., 2001). The heterogeneity of cognitive-emotion deficits in FTD reflects distributed neurodegeneration of frontotemporal part of the brain. Patients diagnosed with FTD show disturbance of emotion processing due to pathological changes affecting networks involved in social cognition. FTD, therefore, provides a useful framework to understand the cognitive and biological architecture underlying of social cognition. My project will use multidimensional data from neuropsychology tests and experimental behavioural to understand emotion processing. The model should incorporate data from different disciplines to provide comprehensive explanations of what is emotion and how emotion is generated. The first research question to be

answered is whether the variation of cognitive deficits following the progression of neurodegenerations affect the ability to process emotions. For example, inability to recognize emotion in semantic variant of FTD may be due to semantic loss. By modelling cognitive-emotion (e.g. working memory, semantic memory, episodic memory, the theory of mind, apathy etc.), I will examine how different cognitive modalities and social cognition predict emotion processing. This project proposes to answer this gap by using different computational approaches to draw mechanistic explanations between the psychological and biological underpinnings of emotion using FTD as a disease model.

P2-10 Effect of cooperative and non-cooperative social interactions on personal space regulation in adults with autism spectrum disorders: An fMRI study.

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Personal Space (PS) is the space immediately surrounding an individual. Intrusion into this space by others can generate feelings of discomfort. Previous studies have shown that in autism spectrum disorder (ASD) the regulation of PS is often altered compared to typically developing (TD) children and/or not modulated by changes in the quality of experienced social interactions. This study aimed at investigating the behavioral and neurophysiological underpinning of PS and its modulation by different types of social interactions in the ASD adult population. Fifteen ASD and fifteen TD matched participants underwent fMRI investigation while performing a distance task for measuring PS preferences. In order to see the effect of social interaction on PS perception, participants and confederates played a repeated trust game session, in which cooperative and non-cooperative interactions were experimentally manipulated. After the game, participants were confronted a second time with the distance task, in order to measure PS preference variation due to the type of social interaction previously experienced. We observed a significant modulation of the trust game on the PS, as TD participants showed increased comfort toward the cooperative player and increased discomfort towards the non-cooperative one, associated with modulation of emotional brain areas (bilateral insula). Notably, we observed the same effect in the ASD population on the behavioral level, but reduced insular activity on the neural level, suggesting a different processing of social interaction. Moreover, ASD participants showed a general reduction of activity in the intraparietal sulcus, a region involved during the observation of approaching stimuli.

P2-11 Trait impulsivity associated with altered resting-state functional connectivity within the somatomotor network.

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Understanding the brain mechanisms underlying self-regulation can provide valuable insights into how people regulate and control their thoughts, behaviours, and emotional states and what happens on those occasions when they fail to do so. Increasingly, the functional connectivity (FC) approach to study the resting state (RS) neuronal networks has provided a valuable tool to examine the mechanisms underlying neurocognitive processes and neuropsychiatric disorders beyond simple differences in task-related brain activity. The current study explored whether individual differences in trait impulsivity are reflected in within- and between-resting-state network architecture using a RS functional connectivity approach. Thirty healthy individuals (9 males) underwent a 7-minute resting-state functional magnetic resonance imaging (fMRI) scan and completed a self-report measure of trait impulsivity and alcohol use. FSL MELODIC, dual regression and FSL Nets were employed to investigate whether individual variability in the within- and between-network functional connectivity pattern might be explained by differences in impulsivity characteristics. Greater self-reported impulsivity was associated with the decreased coupling of the right lateral occipital cortex with the somatomotor network (peak MNI mm 46/-70/16, FWE p-1 = .981). No differences were found in between network connectivity. Our findings indicate that aspects of the functional architecture of the somatomotor network are associated with differences in self-reported impulsivity. This 'decoupling' in more impulsive individuals may reflect itself in a less efficient integration of perceptual information (visual and somatosensory cortices) into behavioural control (motor cortex) leading to impulsive actions and possible negative consequences.

P2-12 Affect arousal during the viewing of staged and real-life videomaterial

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The aim for this study was to find out if there is statistically significant difference in individuals emotional reactions while viewing videos which context are real and videos which context are staged. In this study 49 participants, women, between 20 to 35 years (M = 23.63, SD = 3.28) took part. The study had an experimental design. Participants emotional reactions were measured by electrodermal activity measuring device (e – Health Sensor Shield V2.0 for Arduino). In addition, participants self-assessment about demonstrated videos valency and intensity were examined with survey made by study author. It was found that there are no statistically significant differences between real and staged videos, which indicates that individuals' emotional reactions affected by both video contexts are equivalent. Furthermore, there were no significant differences also in participants valuations between both video contexts.

P2-13 Applied neuroscience: Deconstructing emotions in individual and couple therapy

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Rapid fluctuations and reversals in emotional states are common in couples seeking marital counseling, as well as in individuals with personality disorders. As keynote speaker Lisa Barrett Feldman proposes, emotional responses are constructed within a social context that is informed by lived experience. In this way, past experiences with family members and intimate others can unconsciously create expectations, influence interpretation, and lead to specific emotional and behavioral responses. This presentation will propose ways to work with emotional responses in psychotherapy sessions with individuals and couples that builds upon the concept of constructed emotion. The process involves identifying extreme emotional responses that include shutting down as well as escalation, and working with the client to identify core emotions and the events that stimulated them. The therapist then explores activated memories that share this valence, and deconstructs the emotional experience. The relationship between past and

present are discussed, elucidating the influence of the past, and making sense of emotional overreactions. In some situations, the past can be contrasted with the present, emphasizing strengths when possible. Narrative therapy techniques allow for the construction of alternative meaning as well as awareness of unarticulated needs. Therapy also helps clients recognize the presence of cognitive splitting, where events are responded to as being either all good/perfect, or all bad/terrible. This cognitive style or psychic defense adds to the extreme response and contributes to specific relationship problems. Psycho-education and interventions that strengthen interoceptive awareness add to a model that facilitates the deconstruction and reconstruction of emotional responses

P2-14 Culture influences neural responses to affective stimuli across culturally similar and dissimilar situations

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Previous research suggests that individuals from individualistic and collectivistic cultures, due to different self construal and social groups, might have different emotional experience and attenuate their emotional experiences differently across situations. The current research investigates the influence of these cultural orientations specifically on the neural response to different valences of emotions and across different social situations. Event-related brain potentials were recorded when individualism-representative Dutch in the Netherlands and collectivism-representative Chinese participants in China (N = 40) viewed affective pictures (the IAPS) while being alone, being accompanied by a culturally similar person, or being accompanied by a culturally dissimilar person. The parietal late positive potential (LPP) in Dutch participants showed a differentiation between valences (negative, positive) of emotions while this was not the case for Chinese participants, suggesting a wider range of emotional expressivity in the Dutch group and possibly stronger emotional attenuation in the Chinese group. The Chinese group showed a distinction in LPP amplitude between culturally similar and dissimilar situations whereas the Dutch did not, and this effect was evident only above the right hemisphere. These findings indicate that culture influences neural emotional responding indexed by LPP and suggest that culture might also shape how social context is construed.

P2-15 Development of web-based assessment frameworks for cognitive, emotional, and social functions: A preliminary study on facial emotion recognition

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Deficits in cognitive, emotional, social functions in children and adolescents are likely to lead to clinical problems and may affect the quality of life in the long run. Due to the recent advancement of information technology, early detection of deficits in various functions have become more approachable for high risk children who do not have the chance to receive clinical diagnosis. We present preliminary results from research that is part of an ongoing large-scale project, which is developing and validating a new web-based cognitive, emotional, social function assessment battery. The purpose of the present preliminary study was to test a facial emotion recognition paradigm to see whether this could be applied to the battery as an indicator of cognitive control deficits. Participants watched computer generated videos that showed faces in three emotional continuum: from happy to sad, from happy to anger, and from anger to happy. The video stimuli were generated using frames of morphed faces from FaceGen program, where the emotion continuum was created using the expression morphing scales. Participants were then asked to respond when they detected a change in emotion in the faces and indicate the type of emotional change they noticed (i.e., happy, sad, anger). The results showed that the participants were significantly faster in recognizing a change to an angry face than to a sad face, indicating faster detection of anger than sad emotion even when the changes were not overt. The implication of this facial emotion recognition paradigm to the assessment battery will be discussed.

P2-16 Empathic modulation as a function of cognitive reappraisal and facial expressions.

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Our ability to share the feelings of others can be tracked at the behavioral and at the neural level. However, we might feel empathy but not show it, or we can show empathy without necessarily 'feeling' it. To capture this potential dissociation at the neural level, we asked participants to regulate their feelings or expressions of empathy during the observation of empathy eliciting images. Thirty one-young adults completed a functional magnetic imaging (fMRI) session with the false-belief that their facial responses were being recorded and assessed for legitimacy, and that their brain activity would be used to determine how well they modulated their feelings. We compared brain activity during trials in which participants were modulating their facial expressions with that while modulating their feelings, and observed that both modulations channels were neuro equivalent. We then compared brain activity during all trials in which participants were upregulating with that while downregulating their feelings, and observed that both conditions recruited a basic network involving visual regions, insula, premotor cortex. However, post hoc analysis showed that the downregulation of empathic feelings and expressions led to increased activity in brain regions in the prefrontal cortex, commonly associated to emotional sharing and modulation. Additionally, we observed that the upregulation of empathy led to decreased activity in somatosensory and dorsolateral prefrontal regions. These results emphasize the importance to look at empathy and its facial expressions as a motivated process, that participants can finely regulate by using partially distinct neural substrates and processes.

P2-17 Individual differences in emotion inference from visual narratives

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Humans are adept at inferring the emotional states underlying other people's behavior, the ability we term '*emotion inference*'. Despite its importance, quantitative characterization of emotion inference remains elusive. We approach this problem with the Bayesian framework, which has been fruitful in revealing the internal models that humans adopt to perform a wide range of inference tasks. However, emotion inference poses two important challenges for the Bayesian approach: stimuli must be sufficiently complex and enriched to reflect those in real-life situations and yet their 'true states' must be defined. To address these challenges, we asked a cultural cohort of human individuals to estimate the affective states of visual narratives with diverse real-life contexts. Crucially, we defined true states as the cohort mean estimates, assuming that the 'normative' emotional states are those mostly shared within a cultural cohort under consideration. Then, we regressed individuals' estimates onto these culturally-normative states and characterized their emotion inferences in terms of sensitivity (slope) and bias (y-intercept). We predict that our measures reflect individuals' internal models of emotion inference and thus be correlated with established psychological measures of disposition and sociality that reflect individuals' emotional experience. Indeed, the individuals with high sensitivity and high positive bias in our measures were those who are highly susceptible to and react more positively to emotional life events in psychological measures. Our results suggest that the Bayesian framework, when combined with ecologically valid stimuli and a culturally homogenous cohort, can offer a normative means of characterizing individual differences in emotion inference.

P2-18 Neural substrates of item and source memory for emotional associates: an fMRI study

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Previous ERP research found that objects encoded with emotional, but not neutral, scenes prompt enhanced parietal ERP Old/New differences during recognition, indicating better recollection-based memory for these contextual cues. In the present study, we focused on neural correlates related to this memory enhancement effect using functional magnetic resonance imaging (fMRI). Twenty-nine participants underwent an incidental encoding task in which 132 neutral objects were displayed on 132 different scenes varying in emotional content (44 unpleasant, 44 pleasant and 44 neutral). One week later, the same 132 old objects and 132 novel objects were presented while participants made Remember/Know and source context judgments (i.e. correct content of the associated scene). At the behavioral level, we found that item and context memory performance for emotional associates, compared to neutral ones, was specifically related to recollection-associated Remember judgements. At the neural level, objects encoded with emotional scenes, compared to neutral scenes, produced greater activation in various frontal, temporal, and parietal brain regions during retrieval. Preliminary analysis also indicated distinct activation for item and context memory for emotional associates. Specifically, item memory was related to activity in anterior brain regions involving the ventromedial prefrontal cortex, whereas source memory particularly activated posterior (typical "recollection"-sensitive) regions including hippocampus, parahippocampal cortex, and posterior cingulate cortex. Overall, these findings indicate that contextual cues from emotional events enhance both item and source memory by means of recollection, but with distinct neural activation patterns.

P2-19 Neurophysiological processes and functional neuroanatomical structures underlying proactive effects of emotional conflicts

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There is a strong inter-relation of cognitive and emotional processes as evidenced by emotional conflict monitoring processes. In the cognitive domain, proactive effects of conflicts have widely been studied; i.e. effects of conflicts in the *n-1* trial on trial *n* (Gratton effect). Yet, the neurophysiological processes and associated functional neuroanatomical structures underlying such proactive effects during emotional conflicts are still elusive. The current study combines EEG recordings with signal decomposition methods and source localization approaches for the investigation of the system neurophysiology underlying proactive emotional control. We show that an emotional conflict in the *n-1* trial differentially influences processing of positive and negative emotions in trial *n*, but not the processing of conflicts in trial *n*. The dual competition framework stresses the importance of dissociable 'perceptual' and 'response selection' or cognitive control levels for interactive effects of cognition and emotion. Only once these coding levels were isolated in the neurophysiological data, processes explaining the behavioral effects are detectable. The results show that there is close correspondence between theoretical propositions of the dual competition framework and underlying neurophysiological processes. Hence, processing levels conceptualized in the framework operate in overlapping time windows, but are implemented via distinct functional neuroanatomical structures; the precuneus and the insula. It seems that decoding of information in the precuneus, as well as the integration of information during response selection in the insula is more difficult when confronted with angry facial emotions whenever cognitive control resources have been highly taxed by previous conflicts.

P2-20 Recognition of mixed facial emotion has correlates in eye movement parameters

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The aim of this study was to investigate specificity of eye movement's parameters during mixed facial emotion recognition task. We analyzed the fixation numbers in lower (L) and upper (U) part of emotional face stimuli during emotion recognition task performance. We used morphed emotional faces. Source stimuli were images of basic emotions and neutral face expression. We mixed every emotion sample with each other in different proportions (one emotion in the couple was present in 50%, 66%, 75%, 80%, 83%), thereafter the resulting image was mixed with neutral image in different ratio (100% - morphing without neutral sample, 50%, 33%, 25%, 20%, 16%). Participants were instructed to make the most accurate judgments; they were no limited in time for recognition task and could choose more the one answer. We used ANOVA and Student's t-test. Recognition and perception of mixed facial emotions has correlates in parameters of eye movements. Correct answers accompanied by greater fixation numbers than wrong answers (U: 9.48±0.12 vs 5.68±0.10, t=-24.51, df=10741, p<0.001; L: 6.01±0.06 vs 3.83±0.45, t=-28.99, df=10401,

p<0.001). The larger fixation number was observed in U in comparison with L (6.01±0.74 vs 4.9±0.04, t=-12.91, df=16024, p<0.001). Looking at unnatural mixed emotions faces (e.g., happy-fear) characterized by greater fixation numbers than looking at more natural mixed emotional faces (e.g., happy-surprise) (U: 8.86±0.17 vs 7.14±0.09, t=-8.87, df=4844, p<0.001; L: 5.52±0.09 vs 4.7±0.04, t=-8.44, df=4693, p<0.001). Thus, the spatial distribution of fixations relates with facial emotion recognition specificity in mixed facial emotion recognition task.

P2-21 The effects of varying predictability about emotional content on affective picture processing: An event-related potential (ERP) study

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It is known that expectations about emotional content affect neural and behavioural responses to subsequently presented pictures, but also influence neural activity prior to the presentation of the picture. However, no previous studies have systematically varied the predictive value of the anticipatory cues of emotion content to assess their influence on anticipatory neural processes. To investigate this an affective cueing paradigm was used, where participants viewed and rated the pleasantness of negative and neutral pictures, which were preceded by an anticipatory cue ('S1'), while neural responses were measured using electroencephalography (EEG). In the 'uncertain' cue condition, the cue could be followed by either a negative or a neutral picture with equal probability (i.e., 50%); in the 'fairly certain' condition the cue was followed by a negative picture on 75% of trials, and by a neutral picture on 25% of trials. In the 'certain' condition, the cue was always followed by a negative picture. ERPs were time-locked to the onset of S1, and showed a decreased Early Posterior Negativity (EPN) in the certain compared to the uncertain and fairly certain conditions, and the Late Positive Potential (LPP) over centro-parietal electrodes was increased in the certain compared to the uncertain and fairly certain conditions. These results suggest that the certain expectation of a negative stimulus increased emotional responses to the warning stimulus (S1), but that any degree of uncertainty about the emotional content of the upcoming picture significantly decreased affective responses to the anticipatory cue.

P2-22 The neural component process architecture of endogenous emotion generation

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Emotions stemming from internal sources of information, such as memories or worries, are deeply personally significant and associated with strong subjective affective experiences. Despite the ubiquity of such endogenous emotions and their central role in mental health, the neural processes supporting their generation are largely unknown. We addressed this by proposing and testing a neural component process model of endogenous generation of emotion (EGE) where EGE is supported by cooperation of the salience (SN), default mode (DMN), and frontoparietal control (FPCN) networks, each implementing distinct component processes. In two fMRI experiments (N= 32 and 293) participants generated positive and negative endogenous emotions using self-chosen generation methods. Component architecture and processes implemented by these components were established through functional associations, activation dynamics, and data-driven and model-based connectivity measures of integration. SN formed a distinct functional component, with activation patterns suggesting it was involved in the generation of subjective core affective tone of experiences. Dorsomedial DMN and ventral anterior insula formed a separate component network, and evidence suggested its involvement primarily in the generation of experiential representations. Both components coupled to left frontal FPCN, which demonstrated dynamics consistent with it supporting executive coordination of the generation process. Our results suggest EGE is supported by two processing streams, supported by the DMN and SN, respectively, that is coordinated by the FPCN. By outlining the component process architecture of endogenous emotion generation, our results provide a foundation for research into endogenous emotion in normal, pathological, and optimal function.

P2-23 The role of facial proprioception during face expressions recognition

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When people observe others' emotional facial expressions, they spontaneously and rapidly contract the same muscles used to produce those same expressions (Dimberg et al., 2000). Previous studies have shown faster and more accurate facial expression recognition associated with mimicry: interfering with mimicry reduces people's sensitivity to emotional expressions (e.g., Ponari et al., 2012), and deficits in production reflect recognition deficits (Pistoia et al., 2010). Mimicry would aid recognition by creating a proprioceptive feedback that can be compared with the observed expression (Goldman & Sripada, 2005). Here, we investigated how facial proprioception is related to the facial expression recognition ability and the intensity of mimicry responses. We measured facial proprioception using the only existing standardised method so far, which measures proprioception of lips and jaw (Frayne, Coulson, Adams, Croxson, & Waddington, 2016). In line with previous studies, we found greater corrugator activity during recognition of angry and fearful faces, and greater zygomatic activity during recognition of happy faces. Facial proprioception however was not predictive of facial expressions' recognition ability and mimicry intensity. This is probably due to the fact that the muscles involved in the proprioceptive task are not involved in the production of the facial expressions we tested. Future research should therefore focus on proprioception of the whole face.

P2-24 The role of the endogenous opioid system in emotion identification

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Emotion identification refers to the ability to be aware of and recognize others' emotions. Recently, a new measurement framework of empathy was proposed in which the role of emotion identification when experiencing empathy was emphasized. In a psychopharmacological study in our lab, an effect of the opioid receptor antagonist Naltrexone on subjective empathy ratings for vicarious pain was found. Based on these findings, we tested a presumed relationship between emotion identification of painful facial expressions and the endogenous opioid system. In this study, 44 healthy subjects participated in two functional magnetic resonance imaging (fMRI)

sessions, separated by one week. In a counterbalanced order, participants received one of two different alleged signal enhancer pills per session, which either contained Naltrexone or an inert substance. One hour after medication intake, participants entered the scanner to perform an emotion identification task, in which they were required to make judgements about the emotional content of morphed facial expressions (morphed from pain to disgust from 20%-80% in 10% steps). Participants were significantly less likely to interpret facial expressions as painful in the Naltrexone session than in the control session, although their general ability of emotion identification was not affected by the manipulation. This finding speaks for an influence of opioidergic mechanisms on emotion identification. The analysis of fMRI data is still in progress and results will be presented at the conference.

P2-25 To see or not to see? The neural representation of curiosity for negative images.

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Curiosity is an important human drive. Although some progress is made in studying curiosity for positive or neutral information, little is known about "morbid curiosity" (i.e., curiosity for information involving death, violence or harm). In this fMRI study, we examined the neural representation of curiosity for highly evocative, negative images and, crucially, whether this representation differed from curiosity for positive images. Curiosity was evoked with an active-choice task and contrasted with passive-viewing. Participants in the active-choice condition chose whether or not they wanted to view negative and positive images, based on verbal cues. Participants in the passive-viewing condition viewed images according to response patterns in the active-choice condition. Based on previous work on curiosity, we focused on two a-priori defined regions of interest (ROIs): striatum and inferior frontal gyrus (IFG). As predicted, we found stronger activation in the striatum and IFG for active-choice as compared to passive-viewing, when participants viewed negative cues. In addition, this contrast demonstrated activation in the anterior insula (AI), orbitofrontal cortex (OFC) and anterior cingulate cortex (ACC). Most notably, activation in the striatum, IFG, AI, OFC and ACC was stronger when participants viewed negative as compared to positive choice cues. Active-choice vs. passive-viewing did not result in differential patterns of activation when participants viewed images. These results are consistent with other work on curiosity and suggest that morbid curiosity, as curiosity for non-negative information, involves neural systems associated with reward/salience processing and cognitive control.

P2-26 A coordinate-based meta-analysis of neuroimaging studies on pain empathy: Investigating the role of visual information and perspective

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Pain empathy is a multidimensional construct subserved by neural networks. Researchers have used diverse methods to trigger pain empathy relying on different bottom-up and top-down processes which tapped into empathy's different dimensions. The objective was to provide a core network quantitative map of brain structures involved in pain empathy as well as secondary networks which might depend on the specific properties of stimuli and tasks. A coordinate-based meta-analysis was conducted on brain imaging studies of vicarious pain on healthy populations using the activation likelihood estimation method. A total of 202 studies were retrieved from PudMed, Medline, Embase, CINAHL and PsychINFO. Eighty seven studies were selected yielding 96 experiments, 1343 foci and 2300 participants. Three factors and six conditions were assessed: 1) type of visual information: sensory (body parts) vs. emotional-communicative (facial expressions); 2) visual perspective: egocentric vs. allocentric; 3) cognitive perspective: self- vs. other-oriented tasks. The general map showed consistent activation associated with sensorimotor resonance (SI/SII, thalamus, striatum), affective resonance and/or saliency (anterior insula, anterior cingulate gyrus), self-other distinction (inferior parietal lobule) and socio-emotional processing (amygdala, fusiform gyrus). The six conditions were associated with partly different activation patterns but significantly higher activation likelihood was found only for body parts in the precuneus and the inferior parietal lobule compared to facial expressions. While the type of pain visual information affected the brain response, the visual and cognitive perspectives did not produce detectable effects across studies. Common factors, namely sensorimotor and affective resonance, might have a more prominent effect on brain activation.

P2-27 Affect arousal and valence recognition from EDA asymmetry and HRV measurements during computerised cognitive ability testing

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The purpose of the study was to determine affect arousal and valence levels during computerized testing of cognitive processes, by using skin electrodermal activity (EDA) and Heart Rate Variability (HRV) measurements. 79 participants took part in this study, aged between 21-38 years (M=27.63). Measurement data was collected using Consensys GSR device from Shimmer. GSR signals of left and right wrists of participants were collected, to determine measurement asymmetry. In addition self-reported core affect was measured using Swedish Core Affect Scale (SCAS). Skin electrodermal activity asymmetry and HRV measurements showed significant differences while performing different cognitive ability tests. Self-reported core affect levels of participants didn't show any correlation with electrodermal activity or heart rate variation measurements.

P2-28 Neural mechanisms of socio-emotional trait expression in voices

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Vocal communication is central to most social interactions. Beyond expressing linguistic information, the voice is a rich

source of information regarding the speaker's feelings and intentions. Voluntary vocal modulation can be effectively employed to convey beneficial social information to an interlocutor (Hughes et al., 2014), which might be more easily achieved in highly socially reactive speakers. We investigated the contribution of social reactivity and its neural underpinnings on neural mechanisms of social voice change along the dimensions of the social space (Fiske et al., 2002). Twenty-four healthy participants (aged 18-33) performed a vocal modulation task on 4 bisyllabic pseudo-words in a functional magnetic resonance imaging (fMRI) session. During this task participants were asked to modulate their voice to express hostility, likeability (warmth dimension), intelligence (competence dimension) and body size (general vocal flexibility) using a rapid-sparse sampling protocol. Prior to this task, all participants underwent a resting-state scan. We assessed social reactivity using self-report questionnaires (Davis, 1983; Jones and Paulhus, 2014). Beyond basic vocal motor control, socio-emotional voice change recruits areas related to social processing (bilateral medial prefrontal cortex, superior temporal sulcus and para-hippocampus). The vocal warmth dimension (expressing hostility and likeability) showed distinct neural activation patterns in the right tempo-parietal junction, supra-marginal gyrus and the bilateral amygdala. These data offer insights on the voice as an effective social instrument and its neural mechanisms.

P2-29 The role of interoception in emotion recognition

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People understand and interpret emotional facial expressions by automatically simulating the observed expression and referencing representations of the associated body state. It appears that simulation plays an important role particularly when recognizing subtle change or ambiguous facial emotions expressed by others. However, people vary in the extent to which they are sensitive to the changes in their own bodily states. Therefore, the sense to the physiological condition of the body, called interoception, is likely to modulate individual's sensibility to process emotional expressions of others. In this study, therefore, we investigated the direct relationship between individual's interoceptive ability measured by a heartbeat detection task, and how they are sensitive to various range of emotional intensity expressed by others. We created morphed photos ranging in appearance from 100% neutral to 100% emotional (anger/fear/happiness) with 10% increments. Participants were presented each stimulus for 300 ms and they rated how intense they think each stimulus was. The results revealed that good heartbeat perceivers used wider ranges of intensity level for varied appearance of emotional expressions, compared to poor heartbeat perceivers. Also, good heartbeat perceivers were more sensitive to the physical difference of each facial expression, than poor heartbeat perceivers. These results suggest that interoceptive processing plays an important role on recognizing subtle difference of facial expressions thus contributes to understanding other's mental states precisely.

P2-30 Herding behavior: using brain stimulation to investigate its underlying neural processes

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Herding behavior is a common phenomenon with remarkable economic and social consequences. However, despite its importance little is known about its underlying neural processes and if it constitutes a deliberated strategy or an emotional response. There is consistent evidence of the important role played by the dorsolateral prefrontal cortex (DLPFC) on emotional regulation during decision-making under risk. Based on these findings, we hypothesized that the activation of the right DLPFC activation would only significantly reduce the incidence of herding behavior if this is an emotional response. For this we used transcranial direct current stimulation (tDCS) and eye tracking. The participants were asked to perform a computerized task of stocks purchase. Each screen contained a graph with the stocks' past performance and four pictures of neutral faces. The pictures had signals indicating if that person bought that stock. The stocks were divided in clearly profitable, not profitable or highly variable. The participants were asked to buy the most profitable stocks based on all the available information. They were divided in two groups: active stimulation and sham. The electrodes were placed over bilateral DLPFC (F4 anodal and F3 cathodal). Results showed a high correlation between herding behavior and individual levels of empathy. Moreover, conflicting scenarios were correlated with longer fixation times and more herding behavior. The group receiving active tDCS presented higher levels of pupillary dilation, indicating more cognitive effort. However, these results did not impact the herding behavior, reinforcing the hypothesis that it is a deliberative response.

P2-31 Learned Safety through Cognitive Evaluation: Bridging the gap between the extinction of conditioned responses and cognitive reappraisal

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This study used a novel Learned Safety through Cognitive Evaluation (LSCE) task to explore whether conditioned responses can be reduced through the evaluation of additional information. Participants underwent fear conditioning using letters as conditioned (CS) and electric shocks as unconditioned stimuli (US). During the LSCE phase, the same letters were embedded in words belonging to two categories, one of which was safe (not associated with an electric shock) and one dangerous. We collected fMRI and skin conductance responses (SCR) during this paradigm and hypothesised that participants would reappraise the CS+ when it was presented within the safe category, with increased activation in areas related to semantic decision making, as well as decreased activation in areas involved in threat appraisal, such as the insula. Dangerous CS+ trials were associated with greater SCR and greater activation in the insula than safe CS+, and CS- trials. In contrast, we found increased activation in left vlPFC, ITG, and SPC during safe compared to dangerous CS+ trials, a circuit associated with language and semantic decision making. In a second study we found that high anxious participants showed patterns of responding that suggested increased sensitivity to threat as well as altered processing of safety information. These findings show that conditioned responses can be reduced through cognitive evaluation and suggest that some of the cognitive and neural mechanisms overlap with those recruited during cognitive reappraisal tasks. Results in high anxious participants suggest that safety information is not processed effectively in this group.

P2-32 Transcutaneous vagus nerve stimulation: The effect of different stimulus intensities on cardiac vagal activity

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Transcutaneous Vagus Nerve Stimulation (tVNS) is a technology used to electrically and non-invasively modulate vagal activity. Given the importance of the vagus nerve in physiological, cognitive and in emotional regulatory processes, this stimulation method has recently been receiving increasing attention. However, studies primarily addressing tVNS parameters have been scarce and the lack of knowledge about optimal stimulation parameters may represent an important limitation of this method. The present study focuses on different methods used so far in previous tVNS studies for setting the stimulation amplitude to be used in experiments and aims at identifying stimulation parameters for an optimal cardiac vagal activation. We were interested in the effect of tVNS on a physiological level using vagally mediated heart rate variability (HRV) indicators, as well as in the subjective stimulation perception. Three experiments (within-subject designs, about 60 healthy participants each) have been carried out. In the first experiment, we investigated set stimulation intensities by comparing different amplitudes. In the second experiment, we compared the set stimulation method with the free stimulation method, in which the participants were instructed to freely choose a comfortable intensity. The third experiment compared both methods with their respective sham stimulations. In the first experiment, a main effect of time was found with an increase in HRV over time, but no significant difference between the conditions or interaction effect could be found. In the second experiment, a similar result could be observed by comparing both stimulation methods. Further results will be presented as well as discussed.

P2-33 The beat my heart didn't skip: interoceptive temporal prediction as an implicit measure of interoceptive awareness

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Individual differences in our ability to perceive signals from our body predict a number of emotional and cognitive behaviours (Critchley & Garfinkel, 2017). However, there are a number of confounds with current tasks used to quantify this interoceptive awareness. There is a need for more nuanced, implicit measures of interoceptive sensitivity to better understand the impact of interoceptive processing on cognition. Baroreceptor firing has been shown to modulate intensity of fearful faces (Garfinkel et al. 2014) and the expression of threat-related racial stereotyping (Azevedo et al. 2017); therefore, presenting stimuli at specific points in the cardiac cycle offers a method of measuring interoceptive impact implicitly. In the current study, 30 healthy human participants were instructed to predict the timing of the next flashing square in a sequence by pressing a button. The flashing squares were either presented in synch with participant's own heartbeat (300ms following R-wave) or unrelated to their heartbeat. Participants were asked to rate how confident they were in the accuracy of their response after each trial. There was a significant correlation between the difference in mean confidence scores between the two conditions and interoceptive accuracy measured with a heartbeat counting task (Schandry, 1981). Cardiac timing modulated participant's appraisal of their motor action only in those who are good interoceptors. Additional tasks are required to determine whether interoceptive modulation of feelings of confidence can act as an implicit measure of interoceptive impact that may predict emotional and cognitive behaviours.

P2-34 The emotional Stroop task and sex hormones

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Sex hormones, including estrogen, progesterone and testosterone, exert a widespread effect on the human brain and influence psychological processes. In the fetal stages of development, sex hormones work to organize the central nervous system in a permanent way, whereas in adulthood they exert acute and reversible effects. The present study aimed to investigate the effects of endogenous and exogenous sex hormones on emotional interference in a cognitive task in women. To date, fifty-one women performed the emotional Stroop task twice during the same menstrual cycle phase, at baseline and after short-term, low-dose testosterone treatment. Blood samples were used to measure hormone levels and, together with self-reports, to establish menstrual cycle phase. The digit ratio was measured as a proxy measure of perinatal testosterone exposure. Symptoms of anxiety, depression and aggressiveness were self-reported using psychometric scales. All women were naturally cycling, of good health, not using nicotine or other drugs. Our preliminary findings indicate no difference between women in different phases of the menstrual cycle with regards to E-Stroop slow and fast effect at baseline nor after treatment with testosterone. The right digit ration did not correlate with E-stroop performance. A positive correlation was found between E-stroop slow effect and symptoms of depression, anxiety and aggressiveness. Cognitive slowdown in response to negatively valenced word may not be influenced by menstrual cycle phase; at study completion results will need to be replicated and quantitative associations between hormone levels and cognitive-affective functioning will be investigated.

P2-35 Coupling of structural and functional brain networks explains communicative intelligence and personality traits

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The present study investigates the neurobiological underpinning of communicative intelligence and personality traits by examining the structural and functional brain networks of young healthy individuals. Communicative Intelligence scores with three dimensions (communication competence, emotional competence, and empathic competence), Temperament and Character Inventory (TCI) scores with four temperaments (novelty seeking, harm avoidance, reward dependence, persistence) and three character dimensions (self-directedness, cooperativeness, self-transcendence) were acquired from 92 participants in conjunction with their resting-state functional magnetic resonance images(fMRI) and diffusion tensor images data (DTI). Structural network was constructed using fiber tractography of the DTI data and the functional network was estimated from correlation coefficients of resting-state fMRI time-series at 92 cortical brain regions selected from AAL human atlas. Structural-functional network couplings were evaluated from correlation coefficients between two network elements.

All parameters were estimated at each individual level and were correlated with the communicative intelligence and the TCI scores. The results revealed that individuals who lack of emotional competence (i.e., the ability to recognize, understand, express, and regulate one's emotion) were more likely to have reduced structural-functional coupling in the brain compared to individuals with greater emotional competence. Emotional competence was also positively correlated with global efficiency in the brain, which quantifies the exchange of information across the whole brain network where information is concurrently exchanged. These results suggest that structure-function coupling, a novel method applied in the present study, has a potential to be used as a measure to predict one's psychological characteristics, such as emotional competence.

P2-36 Differences in subjective time estimation of task duration has EEG -correlates in beta-subband

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The aim of this study was to investigate the EEG-correlates of subjective estimation of time spent. We have studied the dynamics of EEG power (10/20 standard electrode positions: O1, O2, P3, P4, C3, C4, F3, F4) during Go/No go task performance. Our participants performed four blocks of Go/No go task trials. They gave verbal time estimation of block duration. We divided all blocks into the three groups accordingly to quartiles of time estimation distribution: overestimation group (OG), accurate time judgments group (AG) and underestimation group (UG). We analyzed the averaged power spectra and averaged relative power spectra (% to whole power spectra 2-30 Hz) in 4-6 Hz, 6-13 Hz and 13-30 Hz frequency bands. We used ANOVA and Student's t-test (with Bonferroni correction). Subjective interval estimation has EEG-correlates in beta-subband (13-30 Hz) ($F_{3,35184}=77.81$, $p<0.001$). The shorter time estimation is accompanied by greater relative beta power (significant differences was observed in all electrode positions for groups UG and OG; in frontal, parietal and left central area (C3) for groups OG and AG; in parietal area, right central area (C4) and left occipital area (O1) for AG and UG). Asymmetry of relative beta-power is observed in frontal (28.4±0.4 vs 26.8±0.3, $t=2.54$, $df=1819$, $p<0.05$) and central (25.2±0.3 vs 26.8±0.3, $t=-3.28$, $df=1847$, $p<0.001$) cortical areas for AG and in parietal area (28.1±0.2 vs 27.3±0.2, $t=2.51$, $df=4600$, $p<0.05$) for UG, no inter-hemispheric differences of relative beta power was observed for OG. Thus, subjective time estimation of task duration has EEG-correlates in relative beta-power.

P2-37 Cognitive approach to Memristor which is able to associative learning

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The memristor, a neuromorphic circuit designed by Chua in 1971, is a modeling of synaptic learning and associative learning. Scientific publications of memristor related neuroscientists, behavioral scientists, cognitive scientists and psychologists are scarce.The aim of this review is to examine the learning models built on the memristor by cognitive perspective. In this study, the learning experiments on the memristor were investigated in the literature and the results were compared. In conditional learning experiments on the memristor, which is its own memory, the unconditional stimulus and the neutral stimulus represent different types of signals. Before the learning, the signals which are denoted as neutral stimuli can not give output from the electronic angle. But just like Pavlov's dog experiment, when the signal representing the unconditioned stimulus was presented before learning, the output is taken. When both stimuli were presented in the order of the Pavlov experiment, the output was taken from the neutral stimulus. And after learning, the output can be taken when the neutral stimulus given alone. In this way, the memristors were able to learn conditionally and to achieve synaptic modeling. It has been found that learning procedures can be applied to hardware devices other than algorithmic devices. The learning experiments on the memristor successfully support the synaptic learning and Pavlov type conditional learning procedures. In some experiments, however, the conditional responses in the memristor do not decrease over time. This can be described as a pathological learning and may reduce the efficiency of the memristor.

P2-38 Investigating the influence of transcutaneous vagal nerve stimulation (t-VNS) on learning in a predictive learning task.

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T-VNS is associated with faster extinction learning in humans. Findings from animal studies employing invasive VNS suggest an enhancement in central Noradrenaline (NA) as a possible mechanism underlying such finding. In humans, noradrenergic manipulations influence learning speed in classical conditioning and predictive-learning tasks. Furthermore, NA is implicated in error-driven attention, a core process in associative learning (see theory of Pearch-Hall). To investigate the effect of t-VNS on reversal learning, error-driven attention, and noradrenergic activity employing a predictive-learning task sensitive to noradrenergic manipulation. 60 participants will be randomly allocated to receive stimulation on either the cymba concha (t-VNS) or lobe (sham) of the left ear. Participants' task is to predict stimuli-outcome and learn the correct associations. Acquisition is followed by reversal learning. The stimulation is administered prior and during reversal learning. Number of errors and phasic change in pupil size (PS) in anticipation of the outcome (error-driven attention) are measured. Tonic PS and salivary alpha-amylase (SA; as noradrenergic biomarkers) are assessed three times: prior acquisition, prior and after stimulation. Compared to the sham group, the t-VNS will make fewer errors, prompt higher phasic change in PS in the early phase of reversal learning and higher level of noradrenergic activity as measured by tonic PS and SA. Error-driven attention will mediate t-VNS effect on learning. This project may provide evidence that NA-enhancement underlies effects of t-VNS on associative learning.

P2-39 Sensitivity to probabilistic regularities during procedural learning: ERP evidence

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Procedural learning facilitates the processing of probabilistic regularities embedded in the environment and contributes to the acquisition of automatic behaviors. Our previous results indicate that ERPs differentiate the

extraction and acquisition of multiple probabilistic regularities originating from the same information stream when the repeating regularity is explicitly cued during procedural learning. However, it is unclear whether ERPs are sensitive to different probabilistic regularities without providing explicit information on the structure of the stimuli. Therefore, we investigated whether the acquisition of statistical probabilities (short-range frequency-based relations among visual stimuli) and sequential structures (long-range order-based relations) can be distinguished using ERPs in an implicit experimental setting. Healthy young adults (N = 21) performed a perceptual-motor procedural learning task while EEG was recorded with 64 electrodes. We measured RTs and ERPs time-locked to the onset of the stimulus. According to RTs, both statistical probabilities and sequential structures were acquired in the early phase of the task. ERPs also reflected the lack of gradual change over time in the acquisition of both types of probabilistic regularities: The frontocentral negative ERP component between 300-380 ms was larger for low-frequency stimuli than for high-frequency ones, and it was larger for the repeating high-frequency chunks of the sequential structure than for the random ones. The observed ERP effects indicate the role of predictive processes during implicit procedural memory formation. These findings suggest that procedural learning could be considered as a domain-general adaptation device supporting the sensitivity to multiple levels of hierarchically organized temporal sequences.

P2-40 Effort can be rewarding depending on task context: The effects of task difficulty and reward contingency on the striatal activation in the brain

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Many reward learning theories posit that effort is aversive, indicating that reward system would be least responsive to difficult and effortful options. However, research in psychology suggests that effort itself can be rewarding. To test this possibility, we examined the relationship between task difficulty and reward network with 51 healthy participants using functional magnetic resonance imaging. Participants were assigned to three groups: Control group participants did not receive any rewards (i.e. they worked on the task out of intrinsic motivation), whereas reward group participants received monetary rewards based on their performance. In the gambling group, task success or failure was probabilistically determined (not by the performance of participants). In all groups, participants worked on a game-like task that had three difficulty levels: easy, moderate, and difficult. The behavioural results showed that the effects of difficulty level on self-reported motivation differed between the groups, $F(4,96) = 25.18$, $p < .001$. In the control group, participants were more motivated with increasing task difficulty, whereas the gambling group showed the opposite pattern. Furthermore, the motivation ratings in the reward group followed an inverted U shape, exhibiting the highest motivation for a moderately difficult task. The neuroimaging analyses mirrored these findings: a bilateral cluster in the ventral striatum showed similar patterns of activation as observed in behavioural analysis ($p < .05$, family-wise error corrected). Our results indicate that contrary to the current popular reward learning theories, effort has differential effects in the reward network depending on context and is not generally aversive.

P2-41 Self-serving bias during reward anticipation while bearing responsibility for others

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Bearing responsibility for others is an important social aspect in our lives. However, it is not well understood how it is influenced by social relationships and group norms. To address this question we investigated behavioral and neural correlates of reward anticipation while participants were responsible for acquiring monetary outcomes for themselves as well as for in-group and out-group strangers. Thirty-six male Chinese volunteers performed a monetary incentive delay task during 3 Tesla functional imaging. In separate blocks, participants were responsible for their own outcomes as well as for the outcomes of unknown responsibility targets (three students with Asian, Black, and Caucasian ethnicity). In addition to whole-brain analyses, we applied a region of interest (ROI) approach assessing bilateral ventral striatum activity during reward anticipation to compare the responsibility targets. Subjectively experienced responsibility was higher for oneself than for Black and Caucasian targets, but did not differ from the Asian target. ROI analysis showed that bilateral ventral striatum activation linearly decreased - with largest activation levels for oneself and smallest for the Asian target. Although our results support the notion of a common neural currency during reward processing, we observed a dissociation between behavioural and neural correlates of bearing responsibility. While subjective ratings indicated comparable responsibility for Asian targets and oneself, neural activation levels in reward-related areas showed the largest differences between these two. Thus, the initial phase of reward anticipation is characterized by some kind of self-serving bias, which affects in particular bearing responsibility for in-group strangers.

P2-42 Subjective expectation, but not objective reward probability, shapes evaluative feedback processing during performance monitoring at the FRN and P3 levels

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Converging evidence in human electrophysiology suggests that evaluative feedback provided during performance monitoring (PM) elicits two distinctive ERP components: the Feedback-Related Negativity (FRN) and P3. Whereas the FRN has previously been linked to (reward) prediction error (RPE), the P3 has been conceived as reflecting specific motivational or attentional processes following the early processing of the RPE, including action value updating. However, it remains unclear whether these two consecutive neurophysiological effects depend on (objective) reward probability, or instead on subjective expectation. To address this question, we devised an experiment where we manipulated reward probability and its expectation using a factorial design, and explored the behavior of the FRN and P3. Sixty-four channel EEG was recorded while 30 participants performed a speeded Go/NoGo task in which evaluative feedback either violated prior expectation regarding reward probability (thereby, creating RPE), or did not, in different blocks. Results showed a larger FRN effect when RPE occurred than when it did not, irrespective of reward probability.

Moreover, the posterior parietal P3 revealed reward updating, if and only if, a large RPE signal captured by the preceding FRN was observed. These results accord well with the dominant theoretical framework positing that evaluative feedback processing obeys a two-stage process where RPE is first rapidly detected (at the FRN level), before the action value is updated (at the P3 level). Furthermore, they add to this literature by showing that subjective expectation, rather than objective reward probability, underlie them.

P2-43 Gonadal hormones, nicotine and the Iowa Gambling Task

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Notwithstanding mounting evidence on the influence of gonadal hormones´ fluctuations on the brain´s structure and function, the role of gonadal hormones on decision-making is understudied. Nicotine, another potential modulator of decisional processes, also seems to be affected by gonadal hormones in its impact on brain and behavior, given the sex differences found in nicotine addiction. The present study sought to investigate the influence of gonadal hormones and nicotine on reward-based decision-making in healthy females by measuring their performance on a computerized version of the Iowa Gambling Task (IGT) twice, at baseline and following nicotine administration. Gonadal hormones levels were determined through blood sampling, after establishing menstrual cycle phase by using self-reports. To date, data from 56 participants has been collected. Our preliminary findings on net monetary gains and losses over the ten IGT blocks suggest high levels of estrogens, alone and in combination with high levels of progesterone, to disrupt the expected learning curve in the IGT. Oppositely, women performing the test in a phase of the menstrual cycle characterized by low estrogens and progesterone levels selected cards more advantageously as the task progressed (i.e. from block one to ten). Data analyses are ongoing; we expect to find a greater number of choices from the advantageous decks in the task performed following exposure to nicotine, compared to the IGT completed at baseline. The findings of this study will advance the understanding of reward-driven decision-making in women by exploring the modulating effects of gonadal hormones and nicotine on this cognitive process.

P2-44 Risk-taking behaviors have an impact on proactive control abilities

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Our ability to adjust quickly our behaviors to a new situation is essential to keep on being adapted to a changing environment. This ability implies control mechanisms and in particular proactive and reactive control processes. We hypothesized that maladaptive behaviors, such as risk-taking, may be explained by perturbations of these cognitive control abilities. Therefore, in this study, we investigated the impact of risk-taking on the ability to perform the Simon Task and the Stop-Signal Reaction Time Task, which are often used to test proactive and reactive cognitive control processes (Simon, 1990; Logan and Cowan, 1984). A modified version of the Balloon Analogue Risk Task (BART) was added to the experimental session in order to assess risk-taking behaviors (Lejuez et al, 2002). Preliminary results were computed on 20 subjects by measuring correlations between the scores at the Simon task or the SSRT task and the scores obtained at the BART. Concerning the Simon task, we show a significant negative correlation between the risk-taking index measured with the BART and the ability to quickly adapt to a conflicting situation in the Simon task (i.e. the Gratton effect; Gratton et al., 1992). The more participants are risk-taking, the weaker is the Gratton effect. However, our results failed to show significant correlations between the reactive control indexes (SSRT task) and the measure of risk-taking behaviors. These results suggest that only the capacity to engage proactive control mechanisms is affected by risk-taking behaviors. These findings will be considered in the light of driving behaviors.

P2-45 Temporal and Effort cost decision-making in healthy subjects with high levels of psychosis-like symptoms

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Several studies have observed altered temporal and effort cost computations relative to rewards in patients with Schizophrenia. Interestingly, these alterations have been considered responsible of the motivational deficits that characterize this syndrome. In the present study we investigated whether individuals with non-clinical psychosis may show aberrant time and/or effort cost computations relative to reward value. To reach this aim, sixty healthy participants with varying levels of psychosis-like symptoms (according to the Community Assessment of Psychic Experience (CAPE) questionnaire) were enrolled and separated into three groups of high positive (HPS), medium positive (MPS) and low positive (LPS) symptoms expression. Participants performed a concurrent schedules task (CST), in which the effort to obtain a reward, i.e. a snack food increases over time. Furthermore, they performed two temporal discounting (TD) tasks with food and money, in which they choose hypothetically between small-immediate and larger-delayed rewards. We found that HPS exerted less effort to obtain snacks on the CST compared to LPS when the effort required was high. Interestingly, participants' effort allocation negatively correlated with negative symptoms at the CAPE. Moreover, HPS showed a steeper TD compared to LPS independently of the type of reward. However, only TD rate for food correlated with negative symptoms. Overall, these results are in line with studies showing an association between altered time and effort allocation and the severity of negative symptoms in schizophrenia. In addition, they show that aberrant temporal and effort cost decision making might also be present at earlier stages of psychotic disorders.

P2-46 Feedback processing in the context of social comparison

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Social comparison calls for the evaluation of one´s own performance in relative terms, by taking into account the performance of other people. We investigated effects of social comparison on the electrophysiological response evoked by performance monitoring. Two participants performed a response-choice task at the same time, and two feedback signals, presented in sequence, described the personal and the other participant's (non-personal) performance. The P2 and the P3a components evoked by personal and non-personal feedback were both augmented when the first feedback signalled an optimal performance, whereas the feedback-related negativity (FRN) was unaffected. Interestingly, the effects were prominent over bilateral fronto-central electrodes. Similar

P2 and P3a modulations for personal and non-personal feedback conflict with interpreting the observed results entirely according to social comparison. Instead, they suggest a general influence of the preceding feedback by setting a context for evaluation in both social and non-social situations.

P2-47 Improving the worst way to induce affect except for all the others

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As an affect induction method, emotionally evocative photographs lie near the sweet spot between ecological validity and experimental control. However, complex images can be a potent source of confounding variance for several neuroscientific outcome measures. To minimize this risk, researchers are encouraged to assure their stimulus sets are perceptually balanced, which can be an ill-defined and time-consuming task. I present an algorithmic pipeline designed to simplify this task by extracting key perceptual image features and distributing stimuli into balanced sets. Relying on the biologically plausible CIE Lab color space, the pipeline extracts summary statistics of pixel distribution across the luminance, green-red, and blue-yellow dimensions as well as of the 2D spatial spectrogram. Balanced stimulus sets are then produced by iteratively sampling perceptual and affective clusters compiled independently from candidate images. The usefulness and feasibility of this approach was assessed using perceptual features extracted from 6764 images in 10 affective stimulus pools. Using this dataset, I analyzed perceptual effects on normative affective ratings and ERP amplitudes as well as assessed the perceptual balance of image sets in published studies. Affective ratings had small but significant relationships with luminance, color, and spatial frequency statistics. These relationships differed across stimulus pools. P1, P3, and LPP amplitudes correlated with energy in low spatial frequencies. The pipeline produced perceptually and affectively balanced image sets that compared favorably with published studies. This work is useful for simplifying stimulus selection as well as for guiding future efforts to incorporate semantic image features and automate the process further.

P2-48 The influence of moral identity on the processing of moral content

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Moral identity is the degree to which being moral is important to a person's self-concept. It is hypothesized to be the "missing link" between moral judgment and moral action. However, its cognitive and psychophysiological mechanisms are still unknown. In this study, we investigated whether people with strong moral identity process prosocial and antisocial actions differently as compared to people with weaker moral identity. In particular, we were interested in whether moral identity modulates the amplitude of earlier components such as P2 or N2, reflecting intuitive, affect-based processes, or later component such as the LPP, reflecting allocation of cognitive resources and more controlled appraisal of a stimulus. Vignettes depicting prosocial and antisocial situations were presented to 75 adult participants while EEG was measured. Afterwards, participants' implicit and explicit moral self-concept was measured, respectively, through an implicit association task (moral self IAT) and a questionnaire (self-importance of moral identity). Results show that the implicit moral self-concept was associated with the amplitude of the P2 component elicited by prosocial scenarios: the more participants associated themselves with moral adjectives in the moral self IAT, the lower the P2 amplitude for prosocial scenarios. This indicates that prosocial stimuli are less salient for people with a strong moral self-concept, probably because these people are used to – and expect to – encounter such situations in their everyday life. This provides important information in understanding the cognitive mechanisms underlying the moral identity, indicating that it modulates not only moral behavior, but also the processing of moral stimuli.

P2-49 Association between brief mindfulness training and the neural correlates of attention

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To better understand and treat mental health issues such as anxiety, depression, and chronic stress, a growing body of research has targeted Mindfulness training (MT) as an effective approach. MT describes a collection of attention practices aimed at cultivating body and mental awareness to interfere with habitual responses and to renegotiate maladaptive self-referential tendencies. Here we report electroencephalographic event-related-potential (ERP) results obtained from a brief MT intervention relative to a randomized control condition in 40 participants. We aimed to investigate the neural mechanisms by which MT mitigates the response to a well-validated attentional paradigm (Sustained Attention to Response Task- SART). The MT group performed a 30 minute breath-focused mindfulness practice at 3 consecutive days in a laboratory environment. The control group performed a coloring activity for 30 minutes, also for 3 consecutive days in the laboratory. The analysis is based on ERP amplitude and latency of N200 and P300 components in a time window of 220-350 and 350-600ms, respectively. A one-way covariance analysis (ANCOVA) was conducted to access between-conditions differences, controlled for pre-training data. We found a statistically difference at the latency of the P300 component at CPz [F(1)= 4,6067, p=0.03] during the NO-GO phase in the post training assessment. Changes in P300 at central-parietal areas have been related to engagement of attention. In summary, our data suggest a rapid improvement in cognitive performance after a brief MT intervention with reduced P300 latency during a sustained attention task.

P2-50 Automatic attention to members of ethnic ingroup and outgroup

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Previous behavioral studies indicate that pictures of members from a different ethnic group than ours (ethnical outgroup) capture attention automatically and involuntarily to a larger extent than members from ethnical ingroup. However, outgroup members presented in automatic attention studies were also unfamiliar to participants, being difficult to disentangle novelty and ethnical effects on the observed results. To explore this issue we included two unfamiliar outgroups: one with a high and one with a low negative charge compared to the ingroup. Moreover, we measured event-related potentials (ERPs) along with behavior to better characterize participants' responses. Seventy-six participants performed a numeric task while facial distracters appeared on the background of the

screen. Distracters were static, front view faces belonging to ingroup (Spanish), low-prejudice laden outgroup (North Europeans) and high-prejudice laden outgroup (South Americans). To further discard novelty as a factor, half of the faces from each group were previously habituated (shown 100 times). The face-sensitive ERP component N170 showed greater amplitudes in response to high-prejudice laden outgroup than to ingroup and low-prejudice laden outgroup for both, habituated and non-habituated faces. Additionally, the difference between N170 amplitude for both outgroups in comparison with the ingroup was directly associated to the implicit prejudice reported by participants toward both outgroups. We interpret that implicit prejudice plays a main role in driving automatic attention toward outgroup members regardless of its familiarity. This research was supported by grant PSI2014-54853-P (MINECO, Spain) and grant FPU13/06512 (MECD, Spain)

P2-51 Exogenous attention to threatening stimuli in motion

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Previous research has shown that emotional stimuli capture more effectively exogenous attention. Some preliminar results suggest that visual attributes preferentially processed by the magnocellular visual pathway, such as low spatial frequencies, play a crucial role in this bias. We explored this issue by manipulating motion, a parameter also processed by the magnocellular system, using active shutter glasses that allowed 3D vision. Participants (N=31) were asked to detect whether two lines (target) had the same orientation or not. Simultaneously, dynamic and static distractors were presented –clips or images, respectively-, consisting of emotionally positive, negative and neutral animals (as previously assessed by an independent sample, N=70). Event-related potentials (ERPs) revealed that participants showed larger posterior P1, N1 and N2 amplitudes for approaching emotional distracters (especially negative ones) compared with neutral and positive static images. Behavioral data showed that negative approaching distracters were associated with longer reaction times and lower error rate. Overall, our data suggest that motion increases the capability of emotional stimuli (especially negative) to capture attention and support the key role of magnocellular processing in this bias. This research was supported by grant PSI2014-54853-P (MINECO, Spain).

P2-52 Neural, somatovisceral, and behavioral correlates of cognitive bias interactions: The link between optimism bias and attention bias

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Optimism bias and positive attention bias are both important for mental health. They have only been examined separately, even though the combined cognitive biases hypothesis suggests that cognitive biases interact and mutually enforce each other. Examining interactions between optimism and positive attention bias can reveal how the biases are maintained over time and thereby contribute to mental health. Thus, the current studies' goals were to investigate the relation between optimism and attention bias and its underlying somatovisceral and neural mechanisms. Studies 1 and 2 showed that optimistic expectancies causally influence attention. Induced optimistic (and pessimistic) expectancies led to enhanced attention orientation and maintenance on rewarding (and punishing) information. This was reflected in shortened reaction times and eye gaze on expected information as well as larger pupil size and enhanced salience and executive control network activity (e.g., insula and anterior cingulate cortex) for unexpected information following both optimistic and pessimistic expectancies. Notably, optimistic expectancies had a stronger influence on attention deployment than pessimistic ones – accompanied by enhanced insula activation during reorientation of attention to punishing information following optimistic expectancies. Study 3 revealed that positively biased attention also causally influences optimism bias. Performing a two-week attention bias modification training guiding attention toward accepting and away from rejecting face stimuli enhanced optimism bias whereas performing a neutral control attention training did not. Our findings provide first empirical support for mutual optimism-attention-bias interactions and therefore explain how the two biases are maintained, possibly leading to an upward spiral of positivity that protects mental health.

P2-53 Auditory action-effect overlap does not modulate error-related ERPs in a flanker task

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Recent theories of voluntary action suggest that actions are encoded in terms of their sensory consequences, and initiating an action involves the activation of the corresponding sensory effect representations. When several action options are available, behavioral response patterns (e.g. interference) are often explained in terms of overlaps between such representations. The goal of the present study was to investigate how the addition of action-effects to response alternatives in a flanker task influenced response-conflict as reflected by event-related potentials (ERPs). It was hypothesized that adding the same sound-effect to both response alternatives would enhance error-related ERPs due to the larger overlap between action-effects in comparison to conditions in which responses elicited different tones, or no tones at all. A two-alternative visual flanker task was administered to 24 young adult participants, who responded by briefly pinching force-sensitive resistors held in their left and right hands. Pinch force was significantly lower in the conditions in which responses elicited tones, suggesting that participants did not ignore the tones. Responses were faster, and accuracy was higher in trials featuring congruent stimulus arrays in comparison to those featuring incongruent ones. Error-related negativity and positivity (measured in incongruent trials) did not differ between conditions. This suggests that despite not being disregarded, the overlap of auditory action-effects did not result in a substantial increase in response-conflict as reflected by error-related ERPs.

P2-54 Competence-based social status modulates affective evaluation and dyadic motor coordination

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Status is a key social dimension among human societies and is often conferred to those individuals that are

perceived as more competent and skilled, especially in small groups. Previous findings suggest that status modulates several aspects of social cognition. However, little is known about the influence of social status on online dyadic motor coordination. In a first experiment (N = 26), participants were engaged in an interactive game with two fake players. We manipulated the scores achieved by the fake players so that one of them would rank first (high status) and the other would rank last (low status). Before and after the manipulation we measured participant's implicit affective evaluation of the two players with a modified version of the Affective Misattribution Procedure (AMP) and explicit ratings of attractiveness, competence, intelligence and dominance after the manipulation. We found a decrease from the first to the second AMP session in the evaluation of the low status player, which was also rated as less competent and intelligent than the high status one, confirming the effectiveness of our manipulation. In a second experiment (N = 16), we tested the influence of social status on motor coordination by asking participants to synchronize with the two players (in a within-subjects design) to perform imitative or complementary reach-to grasp movements. Main results indicate that, only during complementary actions, participants achieved a better performance when interacting with the low status player compared to the high one suggesting that competence-based hierarchical status plays a role in interpersonal coordination.

P2-55 An event-based account of conformity: Cross cultural comparison

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In a previous article, we (Kim & Hommel, 2015) have challenged existing social-psychological accounts of conformity by arguing that what looks like conforming behavior might simply emerge from a failure to distinguish between observations of one's own behavior and that of others. In their commentary, Ihmels and Ache (in press) convincingly demonstrate in reanalysis of our data, that statistically correcting for possible regression-to-the-mean effects makes the conformity effect disappear. While this does not challenge our event-file approach, it suggests that the effect it intended to explain may not be real. In our follow-up study we successfully tested a direct prediction from their account. Given that our design was used by numerous previous demonstrations of"conformity effects" as well, these observations suggest that such effects may no longer exist—which would feed earlier reports of a decline of conformity effects in Western societies (Bond & Smith, 1996). Indeed, in a recent study (Kim, Ma, Sellaro & Hommel, submitted) we successfully demonstrated, in a new design that made regression-to-the-mean effects impossible, that Chinese participants tested in China show significantly stronger conformity effects than western participants

P2-56 How motor pre-selection influences brain activity related to the observation of others' actions

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In the so called automatic imitation paradigm participants are asked to observe actions A or B; the presented hand eventually gets coloured and participants are required to produce, depending on the colour, either action A or B. Even if the observed action is irrelevant for the task, typically in this conditions participants tend to imitate the action observed, in line with the hypothesis that action observation automatically activates motor representations correspondent to the observed actions. However, in real life we do not feel the urge of imitating others actions so often, not even when we are required to react, as in some sport competitions. So which are the brain mechanisms that allow us to control our motor system in a context in which we observe others' actions in order to react to them? A potential role could be played by "motor pre-selection": usually, in order to react to observed actions, we prepare (pre-select) actions that do not resemble those observed (differently from the automatic imitation paradigm). In a Magnetoencephalography experiment we ask participants to provide responses with the hand in a delayed automatic imitation paradigm ('standard' condition), or to perform feet actions in response to the same stimuli shown in the 'standard' condition ('neutral' condition). Our results show that Beta power desynchronisation on the hand motor cortex was less pronounced in the neutral condition compared to the standard condition, suggesting that action observation effects onto the motor system were weakened by the pre-selection of actions not resembling those observed.

P2-57 Machine learning provides novel neurophysiological features that predict performance to inhibit automated responses

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Recently, identifying neurophysiological processes which allow us to predict behavioral performance has received great attention. Most of neurophysiological processes have identified yet are based on correlation methods. However, a major problem about correlation is that it does not imply that it is possible to predict behavior from electrophysiological data. In this research we investigated, how far it is possible to predict behavioral performance form EEG data in Go/Nogo task with N=240 subjects. To this end, we employed two methods for feature extraction (regular ERPs and time frequency) and a machine learning method in combination with source localization in order to predict group membership (i.e. good vs. bad behavioral performers). In regular ERPs during Nogo trials, the accuracy for the best predictive feature was 64% and this feature was associated activation modulations in the motor cortex (BA4). Notably, this feature occurred in the transition between N2 and P3 ERP component peaks. In time-frequency decomposed Nogo data, the best feature could predict behavioral performance up to 67% in theta band and at the almost same time point as the regular ERP. Our findings suggest that processes occurring in-between classically considered neurophysiological correlates of response inhibition (i.e. between the N2 and P3) may be even more important to consider for investigation of response inhibition mechanisms. The identified processes might be related to task updating which is crucial for cognitive control process during the implementation in motor programs.

P2-58 A causal role of parietal gain control mechanisms during cognitive flexibility

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Cognitive flexibility is a core executive function. To flexibly switch between different tasks we often to use external sensory information to update task representations. For these processes, the temporo-parietal junction (TPJ) has been suggested to be important. However, although it is well-known that the efficacy with which sensory information affects behavior depends on gain modulation principles, the importance of sensory gain modulation processes for cognitive flexibility is elusive. In the current study we examine this question using cathodal transcranial direct current stimulation (tDCS) applied over the TPJ. We show that cathodal tDCS over the TPJ increases switch costs. Importantly, this was only the case when external sensory information had to be used to initiate task switching. In a control condition where task

switching was trigger by working memory processes no effects of cathodal tDCS were evident. The results provide evidence for a causal effect of the TPJ on task set updating processes during cognitive flexibility by means of cathodal tDCS. Importantly, this effect was only evident when external sensory information but not when working memory information had to be used to update task sets. The results suggest that cathodal tDCS modulates gain control processes determining whether task sets can be updated during cognitive flexibility using external sensory information.

P2-59 Baseline activation in brain areas involved in social cognition and cognitive control explains individual differences in cooperative behaviour

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Cooperative behaviour is fundamental to society. On a daily basis, however, we see that people vary considerably in their propensity to cooperate. While some individuals are not cooperative ("non-cooperators"), others are highly cooperative ("strong cooperators") – even if their cooperative behaviour can be exploited by non-cooperative others. Yet other individuals cooperate only as much as they believe others will cooperate ("conditional cooperators"). Investigating the source underlying such distinct behavioural types has posed a challenge. Previous attempts have mainly relied on subjective trait measures (e.g., personality questionnaires) and yielded mixed results. Here, we used an objective and stable neural trait measure (resting electroencephalography) and applied a model free clustering approach to participants' behaviour shown in the classical cooperation paradigm (4-person public goods game), known for its high ecological validity. This methodological combination allowed us to identify and characterize the full set of behavioural types in a large sample (N = 137). Findings revealed that strong and conditional co-operators, compared to non-cooperators, were characterized by higher task-independent cortical baseline activation in the temporo-parietal junction, an area involved in social cognition. Interestingly, conditional cooperators (compared to strong and non-cooperators) were also characterized by higher baseline activation in the lateral prefrontal cortex, an area involved in cognitive control and self-control processes. These findings indicate that better social cognition capacities increase the propensity to cooperate, while better capacities for cognitive control and self-control allow for the adjustment of this cooperative propensity – enabling conditional cooperators to minimize the risk of being exploited by non-cooperative others.

P2-60 EEG indices of error monitoring in immersive virtual reality

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Detecting errors in owns and others' actions is a crucial ability for an adaptive behavior. By combining EEG and immersive virtual reality (IVR-CAVE system) we created reach-to-grasp actions of an avatar seen from a first-person perspective, where the action goal was a to-be-taken glass in the peripersonal space. The violation of the goal elicited typical electro-cortical markers of committed/observed errors in time (error-related negativity, ERN; positivity error, Pe) and time-frequency (Theta band) domains. Recent findings from our laboratory linked those cortical signatures with the general sense of embodiment, showing that the mere observation of actions executed in first person perspective induces a sensation of Embodiment (feeling of owning and controlling the virtual body). However, former studies on observed errors used sequences of trials were erroneous actions were less frequent than correct actions. Therefore, it was not possible to disentangle whether the activation of the performance system was due to an error - as a violation of the intended goal - or to surprise/novelty effect associated with rare and less predictable events. We recorded the EEG signal of healthy participants observing correct or erroneous actions performed by an avatar in first-person perspective; importantly the proportion of erroneous action was greater than correct ones. This manipulation elicits the typical error signatures in the erronous actions, showing that, despite event occurrence, the violation of a salient goal – the slip of a to-be-taken glass - triggers the activity of the performance monitoring system.

P2-61 Meditation-induced cognitive-control states affect the top-down control of feature binding

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According to the metacontrol model, people can regulate the relative contribution of intentional (i.e., goal-driven) and automatic (i.e., stimulus-driven) processes to decision-making and action selection by determining the right balance between persistence and flexibility, depending on task, situation, and personal experience. Interestingly enough, mounting evidence has shown that different forms of meditation can have an immediate and systematic impact on an individual's metacontrol state, thereby affecting performance in subsequent, unrelated tasks. Specifically, whereas focus attention meditation (FAM) has been found to bias an individual's metacontrol state towards persistence, open monitoring meditation (OMM) has been found to bias it towards flexibility. The aim of the present study is to assess whether meditation-induced cognitive control states can affect the top-down control of feature binding. Healthy young adults underwent a single session of either FAM or OMM before performing an event-file task, which assesses feature integration and retrieval of stimulus-response episodes. Results showed that FAM, as compared to OMM, reduced the retrieval of task-irrelevant features. These results are consistent with previous findings showing that FAM can boost top-down control and confirm previous observations that engaging in meditation instantly create particular cognitive control states that have specific impact on the individual processing style.

P2-62 Modulation of theta oscillations and conflict processing – Connections in performance and neurophysiology

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Interference control is a crucial aspect of executive functions. It is especially required when stimulus-response conflicts need to be resolved successfully. Neuronal oscillations in the theta frequency range (4-8Hz) have been shown to reflect the level of cognitive control exerted during such situations. It has been speculated that the ability to efficiently upregulate frontal-midline theta power is linked to the efficacy of such interference control

processes. Therefore, the aim of the current study is to investigate a possible connection between conflict resolution and the individual ability to spontaneously upregulate theta oscillatory power. 40 healthy subjects completed a standard flanker task. A 64-channel EEG was recorded simultaneously. The individual ability to spontaneously modulate theta power was assessed in naïve participants by means of a one minute theta-based neurofeedback session. First analyses show that in compatible flanker trials, individuals with better ability to modulate theta display faster reaction times but the same number of hits. In incompatible trials, reaction times do not differ between the groups. Accuracy is lower in the high theta modulators, who also generally show an increased perceptual processing of the stimuli (P1 amplitude). The condition-dependent modulation of the N2 was stronger in the high theta modulators. N2 amplitudes in the low theta modulators were consistently high. The results show that the ability to modulate frontal-midline theta in a time-dependent fashion is related to differences in conflict processing strategies. This suggests that more flexible theta modulation is associated with more effective adaption to given stimuli.

P2-63 On the neural mechanisms underlying the adaptability to varying cognitive control demands

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Cognitive control processes are advantageous when routines would not lead to the desired outcome, but this can be ill-advised when automated behavior is advantageous. Aim of this study was to identify neural dynamics related to the ability to adapt to different cognitive control demands – a process that has been referred to as 'metacontrol'. This was done in a sample of N=227 healthy subjects that was split in a 'high' and 'low adaptability' group based on the behavioral performance in a task varying control demands. To examine the neurophysiological mechanisms we combined event-related potential (ERP) recordings with source localization and machine learning approaches. The results show that individuals who are better at strategically adapting to different cognitive control demands especially benefit from automatizing their response processes in situations, where little cognitive control is needed. On a neurophysiological level, neither perceptual/attentional selection processes nor conflict monitoring processes paralleled the behavioral data. Behavioral differences in metacontrol abilities were only mirrored by the modulation of response-locked P3 ERP amplitudes, which were accompanied by activation differences in insula (BA13) and middle frontal gyrus (BA9). The machine learning result corroborates this by identifying a predictive feature near the peak of the response-locked P3 and suggests that also the anterior cingulate cortex (BA24; BA33) is important to consider. Therefore, metacontrol is associated to the ability to manage response selection processes and is more dependent on the ability to effectively downregulate cognitive control under low cognitive control requirements than on upregulating cognitive control.

P2-64 Opposing effects of binge drinking on consciously vs. subliminally induced cognitive conflicts

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Binge-drinking is a very prevalent and potentially harmful behavior, yet very little is known about the specificity of its effects on behavior and the underlying neurophysiologic mechanisms. While it is generally accepted that alcohol impairs top-down cognitive control and conflict monitoring, it has remained unclear whether this also applies to subliminally triggered conflicts, as alcohol may not impair automated processes to the same extent. To investigate this, we used a within-subjects design in a sample of n=22 healthy young male subjects performing a complex response conflict paradigm while an EEG was recorded. Behavioral data showed that a binge-like intoxication of 1.1 ‰ increased the response conflict induced by consciously perceived flankers, but paradoxically decreased the response conflict induced by subliminal primes. The latter was found to be reflected in decreased amplitude differences in the visual N1, which reflects attentional aspects of stimulus processing, and the N2 as well as a following central negativity, which are thought to reflect conflict monitoring and cognitive effort. On the neuroanatomical level, we found the decrease in subliminally induced response conflicts to be based on changes in fronto-parietal networks (including BA 7 / the precuneus, BA 40 / the postcentral gyrus, BA 23 & 24 / the cingulate cortex and BA 13 / the insular cortex) that subserve attention allocation, the processing of complex stimuli and cognitive conflict. It can be concluded that alcohol intoxication paradoxically reduces subliminally triggered response conflicts, which may be caused by decreased allocation of attention towards less salient/noticeable stimuli.

P2-65 Response selection codes in neurophysiological data predict conjoint effects of controlled and automatic processes during response inhibition.

W. X. M. Chmielewski, M. Mückschel, C. Beste
Kognitive Neurophysiologie, TU Dresden, Germany

The inhibition of prepotent responses is a requirement for goal-directed behavior and several factors determine corresponding successful response inhibition processes. One factor relates to the degree of automaticity of pre-potent response tendencies and another factor relates to the degree of cognitive control that is exerted during response inhibition. However, both factors can conjointly modulate inhibitory control. Cognitive theoretical concepts suggest that codings of stimulus-response translations may underlie such conjoint effects. Yet, it is unclear in how far such specific codes, as assumed in cognitive psychological concepts, are evident in neurophysiological processes and whether there are specific functional neuroanatomical structures associated with the processing of such codes. Applying a temporal decomposition method of EEG data in combination with source localization methods we show that there are different, intermingled codes (i.e., "stimulus codes" and "response selection codes") at the neurophysiological level during conjoint effects of "automatic" and "controlled" processes in response inhibition. Importantly, only "response selection codes" predict behavioral performance, and are subject to conjoint modulations by "automatic" and "controlled" processes. These modulations are associated with inferior and superior parietal areas (BA40/BA7), possibly reflecting an updating of internal representations when information is complex and probably difficult to categorize, but essential for behavioral control. Codes proposed by cognitive, psychological concepts seem to have a neurophysiological analogue that fits into current views on functions of inferior and superior parietal regions.

P2-66 The attentional blink and dopamine markers

A. C. Trutti, Z. Sjoerds, B. Hommel
Cognitive Psychology Unit, Psychology Department, Leiden University, The Netherlands

The Attentional Blink (AB) represents an impairment in identifying the second of two stimuli presented in a rapid sequence of stimuli, in which the accuracy of reporting the second related to the limitation of resources for stimulus processing in working memory. Due to the role of (striatal) dopamine (DA) in working memory findings suggest dopaminergic modulation of individual performance in the AB task. Recently, efforts have been made to identify behavioural and physiological markers of (striatal) DA such as spontaneous eye blink rate (sEBR) and color discrimination (CD). In this study we tested whether we can replicate an earlier finding that sEBR predicts the individual magnitude of the AB (Colzato et al. 2008). In a second step, we aimed to relate for the first time, general CD performance to performance in the AB task, given that CD is impaired in many DA-related pathologies. Quantitative and qualitative CD and sEBR data of seventy subjects was assessed prior to measuring performance in an AB task. As a potential mediating variable, mood data was collected at both, sEBR and AB assessment, respectively. Results support the previous finding that sEBR predicts AB magnitude, but suggest no relationship between AB magnitude and CD, neither quantitative, nor qualitative CV. Mediation analysis revealed a mediating effect of mood on the strength of the relationship between sEBR and AB. Our findings suggest that the AB relies on striatal DA only, which is likely to be associated with sEBR, but not (or not to the same degree) with CD.

P2-67 The intensity of early attentional processing, but not conflict monitoring, determines the size of subliminal response conflicts

W. Bensmann, A. Vahid, C. Beste, A.-K. Stock
TU Dresden, Kognitive Neurophysiologie, Germany

Response conflicts hamper goal-directed behavior and may be evoked by both consciously and subliminally (unconsciously) processed information. Yet, not much is known about the mechanisms and brain regions driving the size of subliminally induced conflicts. We hence combined a response conflict paradigm featuring subliminal primes with in-depth neurophysiological (EEG) analyses, including source localization in a sample of N=243 healthy subjects. Intra-individual differences in the size of subliminal conflicts are reflected both during early attentional stimulus processing (prime-elicited N1 and target-elicited P1 and N1 amplitudes) and conflict monitoring (N2 amplitudes). On the neuroanatomical level, this was reflected by activity modulations in the TPJ (BA39, BA40) and V2 (BA18), which are known to be involved in attentional stimulus processing and task set maintenance. In addition to a "standard" analysis of event-related potentials, we also conducted a purely data-driven machine learning approach using support vector machines (SVM) in order to identify neurophysiological features which do not only reflect the size of subliminal conflict, but actually allow to predict it. This showed that only extremely early information processing (about 65 ms after the onset of the prime) was predictive of subliminal conflict size. Importantly, this predictive feature occurred before target information could even be processed and was reflected by activity in the left middle frontal gyrus (BA6) and insula (BA13). We conclude that differences in task set maintenance and potentially also in subliminal attentional processing of task-relevant features, but not conflict monitoring, determine the size of subliminally induced response conflicts.

P2-68 The system-neurophysiological basis of developmental changes in sequential cognitive flexibility between adolescents and adults

F. Giller, R. Zhang, V. Roessner, C. Beste
Kognitive Neurophysiologie, TU Dresden, Germany

Cognitive flexibility is a major facet of executive functions and often refers to sequential task control; i.e. it is very likely that one may re-encounter a task that has previously been abandoned to carry out a different task. In the context of sequential cognitive flexibility, the 'backward inhibition (BI) effect' has been studied quite extensively. Here we ask whether there are age-related differences between adolescents and adults in BI and what system-neurophysiological mechanisms underlie these modulations. This was examined in a system neurophysiological approach combining event-related potentials data with source localization and EEG signal decomposition methods. We show that sequential cognitive flexibility, as assessed using backward inhibition, is inferior in adolescents compared to adults. That is, the backward inhibition effect is stronger in adolescents. The neurophysiological data suggest that two partly inter-related processes underlie stronger backward inhibition effects in adolescents than adults: One process refers to an insufficient suppression of the inhibitory effect of the n-1 trial on the n-2 trial that is associated with right inferior frontal regions. The other process refers to immature response selection and conflict monitoring processes associated with medial frontal cortical regions.

P2-69 Pinging the brain - Uncovering hidden states that encode duration and orientation in working memory

J. de Jong, H. van Rijn, E. Akyürek
Behavioural and Social Sciences, University of Groningen, Netherlands, The

Recent work stresses the importance of hidden-state mechanisms, such as short-term synaptic plasticity, in working memory (WM) and time perception. However, it is hard to test hidden-state theories, as lack of neural activity – the defining feature of hidden-states – elude their detection using traditional neuroscience methods. A promising method that could overcome this problem is 'Neural Sonar'. An impulse stimulus is used - analogous to the 'ping' in sonar - during WM maintenance to elicit a response from the brain that reflects the state of the activity-silent neural network encoding WM information. Earlier work has shown that the identity of WM items can be decoded with Multivariate Pattern Analysis. Can we also 'ping' how duration is encoded in the brain? Subjects memorize both the orientation and duration of a grating. Then, a cue indicates whether the response should be based on orientation or time, after which the "ping" is presented. Lastly, a probe is shown, and participants indicate whether it was rotated (clockwise/counterclockwise) compared to the grating when the cue was orientation, or whether it was longer or shorter when the cue was time. Hypothesis: The working memory hidden-state representation of time is reflected in higher decoding accuracy of duration after the 'ping' for time trials than for orientation trials A pilot study with an adaptive staircase procedure showed that subjects can perform this task reasonably well for both orientation and duration. EEG decoding results will be presented after data collection has completed.

P2-70 The truth about energy drinks: Product presentation and cognitive effects

M. E. Vanutelli, I. Angileri, C. Lucchiari
Philosophy, Università degli Studi di Milano, Italy

The consumption of energy drink is commonly associated with greater physical and cognitive performance. However, there are contradictory results on this issue because the influence of each single component, nor the interactions between them, is still not clear. In addition, the mechanisms underlying neuromarketing techniques and their influence on consumer behavior should be clarified, as well as their effects on cognitive and subjective

variables. Thus, the purpose of this study was to investigate the effects related to marketing strategies on participants' behavioral performance after consuming energy drinks, to highlight if and how product presentation can influence it. 17 graduated volunteers, 9 females and 8 males, participated in the research and were randomly assigned to two different groups. One group (P) received a product card with a description reinforcing its positive physical effect (power, resistance…), while the other group (C) about its positive cognitive effect (concentration, memory…). Then, participants were required to perform some cognitive tasks, before and after drink consumption, to investigate the variation of cognitive abilities such as reasoning, executive functions, working memory, and verbal fluency. EEG, autonomic parameters and blinks were recorded during the experimental sessions. Also, subjects were required to complete some personality tests. Results revealed, after drink consumption, a decrease in solution time (Tower of London, TOL); an increase in Sudoku performance and an increase in numbers of blinks. Also, some effects related to personality and performance was found, such as betweenreward sensitivity and solution time.

P2-71 COMT Val/Met polymorphism does not modulate the effect of transcranial direct current stimulation on working memory in healthy humans

A. Loseva[1], B. J. Jongkees[1], M. Nitsche[2], L. S. Colzato[1]

[1]Cognitive Psychology Unit, Leiden Univeristy, Netherlands, The; [2]Department of Clinical Neurophysiology, Georg-August University Göttingen

Transcranial direct current stimulation (tDCS) is an increasingly popular method of modulating cognitive functions in humans. However, some doubt its efficacy as findings are inconsistent or remain unreplicated. It is speculated dopamine (DA) might play an important role in this inconsistency, by determining the direction and strength of the cognitive-behavioural effects of tDCS. Previous findings have shown that that tDCS differentially affects individuals carrying certain DA-related genetic polymorphisms (Nieratschker et al., 2015; Plewnia et al., 2013). However, the sample size of these previous studies was limited and the idea that DA-related genes modulates the effect of tDCS warrants replication and further support. In addition, no studies have looked at the impact of DA-related genes on tDCS and working memory, the most-often investigated cognitive function in tDCS studies. In our study 142 healthy subjects, genotyped for the COMT Val/Met polymorphism, participated in a sham-controlled crossover study to investigate the effect of bilateral tDCS over DLPFC on working memory (as indexed by the n-back task). Individual genetic profile did not predict any behavioural effects of tDCS. We suggest that DA manipulations affecting dopaminergic state (e.g., pharmacological interventions) are more likely to modulate the cognitive-behavioral effects of tDCS, as compared to dopaminergic traits (e.g., genetics).

Session

Cognitive control

Time: **Saturday, 21/Jul/2018: 2:30pm - 3:50pm**

Location: **CZ-1**

Session Chair: **Bernhard Hommel**

2:30pm - 2:50pm

Mental control of temptation: The moderating role of BIS and BAS sensitivity

A. Wytykowska

Psychology, University of Social Sciences and Humanities, Poland

One of our daily challenges is to control temptations. However, self-regulatory processes of behaviour towards tempting stimuli often fail due to the usage of maladaptive strategies to control them. A model of processing temptation was proposed. It was assumed that the attractiveness of tempting stimuli results from their positive evaluation (on automatic and reflective level). Therefore mechanism responsible for the efficient mental control shall be related to the decrease in positivity elicited by tempting stimuli. The effectiveness of mental distraction and mental consumption of tempting stimuli (two form of mental control) on an automatic and reflective evaluation of sweets and the desire for sweets consumption were tested. The moderators were individual differences in approach and avoidance motivation. The group of students (N=92) reporting the problem with the control over sweets eating took part in the experiments. Results showed that distraction from sweets decreases both the reflective and automatic measure of affective evaluation of sweets and of desire to eat sweets in comparison to the strategy of sweets consumption in imaginary. BIS sensitivity mainly moderated the automatic evaluation of sweets, while BAS sensitivity moderated the reflective desire to consume sweets. Results will discuss the role of individual differences in approach and avoidance motivation in the effectiveness of self-regulation as well as their consequences for psychopathology.

2:50pm - 3:10pm

Revealing cognitive control processes in normal impulsivity by electrophysiological recordings

F. Grisetto, Y. Delevoye-Turrell, C. Roger

SCALab, UMR CNRS 9193, Université de Lille, France

Cognitive control is a necessary set of executive functions for the ability to adapt our goal-directed behaviors. Studied in conflictual tasks, cognitive control processes are classically investigated by behavioral measures and electroencephalography (EEG). Usually impulsive subjects show faster RTs and a decreased Ne/ERN (« error (-related) negativity », Falkenstein et al., 1991; Gehring et al., 1993), a fronto-central electrical activity specific to action monitoring processes (Ruchsow et al., 2005). However, electromyography (EMG) can reveal small incorrect muscular activations successfully controlled (i.e. detected, inhibited and corrected) observed in 15-20% of the correct trials (Eriksen et al., 1985). These activities, often ignored, demonstrate efficient reactive control processes. In this study, participants performed a Simon task (Simon, 1990) during which EEG and EMG activities were recorded in order to precise the influence of impulsivity personality traits on the efficiency of reactive control processes. Impulsivity was assessed by personality questionnaires

(e.g. BIS-11, Patton et al., 1995). Results confirmed the reduction of the Ne/ERN magnitude in impulsive subjects. However, reaction times and error rate did not differ according to impulsivity scores. More interestingly, the investigation of partial errors showed that impulsive participants make more partial errors but are very efficient to detect, inhibit and correct them. It seems that impulsive subjects are more likely to engage incorrect activations but are able to correct them in time. We assumed that this enhanced correction capacity compensates for the lack of performance monitoring in impulsive normal population and may be ineffective in pathological population.

3:10pm - 3:30pm

Conflicting conflicts: The interplay of conflict monitoring processes

W. X. M. Chmielewski, **C. Beste**
Kognitive Neurophysiologie, TU Dresden, Germany

Acting adequately in a given situation is complicated by the presence of ambiguous information. Being able to overcome such conflicts is a necessary prerequisite for everyday life. Depending on the nature of a conflict (i.e. Simon & Stroop conflicts) different behavioral outcomes and neurofunctional correlates can be observed. A question that still remains to be addressed is how a combination of different conflicts affects response selection performance and how this is mediated on a neurofunctional level.
In the current study we examine this question using a novel experimental paradigm with exclusively Simon, exclusively Stroop, or combined Simon-Stroop conflict stimuli in a system neurophysiological approach combining EEG recordings with source localization analyses. The results show that Simon and Stroop conflicts equally aggravate response selection performance. More importantly, response selection performance is less accurate in trials with combined Simon-Stroop conflicts, showing a super-additive aggravation of response selection. On a neurofunctional level it is shown that Simon conflicts relate to the N2, while Stroop conflicts relate to the N450. For Simon-Stroop conflicts, the results show that an engagement in conflict monitoring processes, which are deployed in response to Simon conflicts (N2), is disadvantageous for overcoming Stroop conflicts, as depicted in a decreased N450 amplitude. This study shows that it is important to consider the temporal course of conflict resolution and effects of temporal overlap for simultaneously occurring conflicts.

3:30pm - 3:50pm

Towards a unitary model of human decision-making and action control

B. Hommel
Cognitive Psychology, Leiden University, Netherlands, The

From its academic beginnings, the theory of human action control has distinguished between endogenously-driven, intentional action and exogenously-driven, habitual or automatic action. I challenge this dual-route model of action control and argue that attempts to provide clear-cut, straightforward criteria to distinguish between intentional and automatic action have systematically failed. In particular, I will argue that there is still no evidence for intention-independent action, and that attempts to use the criterion of reward sensitivity and rationality to differentiate intentional and automatic action are conceptually unsound. As a more parsimonious, and more feasible alternative, I suggest a unitary approach to action control, according to which actions are (a) represented by codes of their perceptual effects; (b) selected by matching intention-sensitive selection criteria; and (c) moderated by metacontrol states.

Session

SYMPOSIUM - The Social Cerebellum: New insights and evidence

Time: **Saturday, 21/Jul/2018: 2:30pm - 3:50pm**
Location: **CZ-2**

Organizer(s): **Frank Van Overwalle**

Although the cerebellum is traditionally viewed as involved in motor functions, research since the 1980s revealed that non-motor cognitive functions also play a significant role. However, the social function of the cerebellum has been largely ignored, until a recent meta-analysis in 2014 by Van Overwalle and colleaguous. But what is the social function of the cerebellum? Frank Van Overwalle offers the hypothesis that an extension of the typical cerebellar capacity to execute and automatize smooth sequences of one's motions, allowed humans to understand, automatize and generate -- in their mind -- action sequences of the behaviors of others. This is an indispensable requirement to understand actions and emotions of others. To explore this hypothesis, he tested cerebellar patients and found that generating the correct order of social actions containing elements of false beliefs showed significant differences with healthy matched controls, while ordinary (overlearned) actions and mechanical sequences did not. Giusy Olivito found in 9 SCA2 cerebellar patients pathological changes in cerebellar gray matter (GM) and the main cerebellar white matter (WM) microstructure, as well as reduced theory-of-mind abilities to correlate with these alteration patterns. Chiara Ferrari found that transcranial magnetic stimulation (TMS) over the (left) cerebellum impaired participants' ability to categorize facial emotional expressions (explicit emotion perception) and their ability to classify the gender of emotional faces (incidental emotional processing). To alleviate cerebellar impairments, Kim van Dun discusses several brain stimulation techniques that can alter the functionality of the cerebellum.

2:30pm - 2:50pm

New findings on role of the Cerebellum in understanding social action sequences

F. Van Overwalle
Psychology, Vrije Universiteit Brussel, Belgium

Recent neuroimaging research has revealed that the posterior cerebellum plays a critical role in social reasoning, and in particular in understanding beliefs and making attributions. One hypothesis is that the cerebellum is responsible for the understanding of sequences of motions and actions, and the automatization of these action sequences. Automatization of actions in their correct order are a prerequisite for understanding false beliefs and traits. In order to test this hypothesis, we tested for the first time patients with generalized cerebellar degenerative lesions on a number of tests of social and affective understanding, and compared their performance with matched control volunteers. The tests involved matching of different faces showing the same affective expression, understanding mentalizing during reading false belief stories (Dewey, 1991), making causal and trait attributions on the basis of short behavioral sentences (Kestemont et al., 2016), and generating the correct order of social actions depicted in cartoons (Langdon & Coltheart, 1999). Only the latter tests showed clear deficits in cerebellar patients. In particular, patients performed at or close to normal in generating the correct order in

mechanical stories and social scripts, but performed much worse when dealing with cartoons depicting false beliefs. In addition, cerebellar patients performed marginally worse on trait attributions inferred from verbal behavioral descriptions. We discuss additional control conditions and tasks, in order to get a better understanding of the social impairments of the cerebellar patients and the critical role of the cerebellum in social understanding.

2:50pm - 3:10pm

Novel insight into understanding the cerebellar contribution to autistic-like symptoms.

G. Olivito[1,2], S. Clausi[1,3], M. Leggio[1,3]

[1]Ataxia Research Laboratory, IRCCS Santa Lucia Foundation, Rome,Italy; [2]Neuroimaging Laboratory, IRCCS Santa Lucia Foundation, Rome, Italy; [3]Department of Psychology, "Sapienza" University of Rome, Italy

Over the years, the cerebellar role in cognitive functions has been widely accepted. Most recently, the cerebellum has garnered an increasing attention in the context of social cognition research and increasing evidences have been collected showing the cerebellum also to play a role in Theory of Mind (ToM), (Van Overwalle et al., 2014; Hoche et al., 2015). In the context of this research topic, studies on patients with primary cerebellar disease can prove very useful to buttress the view that the cerebellum may play a role in the generation of appropriate social behaviors. Spinocerebellar ataxia type 2 (SCA2) is an autosomal dominant neurodegenerative disease selectively affecting the cerebellar cortex and thus representing an interesting model to investigate the functional specialization of the cerebellum and cerebello-cerebral loops in social domain. To this aim, pathological changes of cerebellar gray matter (GM) volumes and white matter (WM) microstructure (WM) were investigated in 9 SCA2 patients compared to a control group. Additionally, ToM abilities were also assessed. A specific pattern of both cerebellar GM volumes and WM microstructure was found. Interestingly, GM atrophy in specific cerebellar regions and microstructural WM alterations correlated with patients' ToM performances. Our results provide evidence that cerebellar anomalies could have a selective impact on different cerebello-cerebral social networks and thus account for the specificity of SCA2 patients' ToM impairment. This paves the way to gain new insight into understanding social deficits in those pathological conditions in which a cerebellar damage is reported, such as autism.

3:10pm - 3:30pm

TMS over the cerebellum reveals the role of the cerebellum in emotional and social processing

C. Ferrari[1], T. Vecchi[2,3], Z. Cattaneo[1,3]

[1]Department of Psychology, University Milano-Bicocca, Italy; [2]Department of Brain and Behavioral Sciences, University of Pavia; [3]IRCCS Mondino Foundation

Growing evidence suggests that the cerebellum plays a critical role in non-motor functions, contributing to cognitive, affective and social processing. In particular, the cerebellum might represent an important node of the "limbic" network, underlying not only emotion regulation but also emotion perception and recognition. Moreover, recent views consider the cerebellum as a crucial neural component of the "mentalizing" network. We carried out a series of experiments using transcranial magnetic stimulation (TMS) to shed further light on the role of different sectors of the cerebellum in (explicit and incidental) emotional processing and social perception. In a first study, we found that TMS over the cerebellum impaired participants' ability to categorize facial emotional expressions (explicit task) and to classify the gender of emotional faces (incidental emotional processing task), but not the gender of neutral faces. In a second study, we combined TMS with a standard attitude-priming task in which Caucasian participants had to categorize the valence of a series of adjectives primed by either an in-group or an out-group face. We found that TMS over the cerebellum significantly interfered with the modulation exerted by group membership on adjective valence classification, abolishing the in-group bias observed at baseline. Overall, our findings point to an important contribution of different sectors of the cerebellum in emotion processing and social perception.

3:30pm - 3:50pm

The potential value of transcranial and electric stimulation of the cerebellum

K. van Dun[1], M. Manto[2]

[1]Vrije Universiteit Brussels (VUB), Vrije Universiteit Brussels (VUB), Belgium; [2]Unité d'Etude du Mouvement, Laboratoire de Neurologie Expérimentale, Université libre de Bruxelles (ULB), Brussels, Belgium

Improving brain functions by modulating neuronal excitability with noninvasive techniques such as tDCS and TMS is an exciting new research domain. Since the cerebellum is connected with cortical regions subserving motor, cognitive and affective functions via cerebellothalamocortical pathways, it might be an interesting target. We conducted a literature search to determine the validity of cerebellar stimulation in each of these domains. The cerebellum is involved in motor functioning and is responsible for monitoring current movements, predicting future states, and detecting/correcting errors (state estimations). Cerebellar TMS and tDCS seem to have a different impact on motor functioning depending on complexity, task, and strategy. Cerebellar stimulation usually interferes with cognitive processing in a subtle manner. Therefore, specific methods to measure effects and timing are crucial. A lot of parallels may be drawn with the motor literature, with a differential impact depending on complexity, task, and strategy, and a role for the cerebellum in perception/processing, error correction, learning, and accuracy. Although only a handful of experimental studies exist, there is also evidence that cerebellar stimulation might modulate affective and somatosensory processing. In clinical populations, cerebellar stimulation might become powerful substituting or adjuvant therapeutic tools by restoring the cerebellocerebral functional connectivity. Several studies have shown that repeated sessions of cerebellar stimulation may exert long-lasting positive effects on motor, cognitive, and affective defects. However, in order to use TMS and tDCS as standard (clinical) practice techniques, it is crucial to learn more about the working mechanisms and impact of the different stimulation protocols.

Session

SYMPOSIUM - Putting interoception at the heart of social cognition: Addressing methodological, conceptual and research challenges

Time: **Saturday, 21/Jul/2018: 2:30pm - 3:50pm**

Location: **CZ-3**

Organizer(s): **Manos Tsakiris**

Interoception describes the processing and awareness of body-to-brain axis of signals that are essential for ensuring

the organism's homeostatic needs. Beyond homeostasis, a renewed interest in interoception across psychological sciences and neurosciences has highlighted its importance for mental health and social cognition. At the same time, important methodological, conceptual and experimental challenges hinder our progress. The proposed symposium will offer new insights on how interoceptive research can overcome such challenges, providing converging views from social neuroscience, developmental, clinical, and experimental psychology. Murphy will present new interoceptive measures and findings on their validity in relation to emotion processing. Atzil extends the known role of interoception from homeostasis to allostasis presenting behavioral and neuroimaging findings during allostasis regulation in carer-infants dyads. Fotopoulou focuses on affective touch and pain, two modalities that resonate with modern definitions of interoception, emphasizing its motivational aspects and its importance for social interactions. Tsakiris presents versions of new implicit measures of interoceptive sensitivity, for infants and adults and their empirical application in addressing questions of relevance to social neuroscience such as emotion perception and regulation, self- and social-awareness. Taken together, the four talks will provide diverse viewpoints that as a whole can provide a more nuanced understanding of the role of interoception for cognitive, affective and social processing. All four talks touch upon the methodoloical, conceptual and research challenges, offerring viable advances and testable hypotheses for future research. We foresee these four 20-minutes talk to allow time for a general discussion.

2:30pm - 2:50pm

The relationship between alexithymia and interoception across domains and dimensions of measurement

J. Murphy[1], C. Catmur[2], G. Bird[1,3]

[1]Social, Genetic and Developmental Psychiatry Centre, King's College London, United Kingdom; [2]Department of Psychology, Institute of Psychiatry, Psychology and Neuroscience, King's College London; [3]Department of Experimental Psychology, University of Oxford

Interoception, the perception of the internal state of one's body, has been implicated in various aspects of higher order cognition, notably emotional processing. Indeed, almost all theories of emotion ascribe a role for internal signals in emotional experience. Building on these proposals a growing body of research has focused on interoception in alexithymia, a condition characterised by difficulties identifying and describing one's emotions, and an externally orientated thinking style. These studies indicate small but significant associations between alexithymia and interoception across domains (e.g., cardiac, respiratory) and dimensions (e.g., self-report vs. objectively measured accuracy/propensity) of measurement supporting proposed links between interoception and emotional experience. Specifically, these data suggest that alexithymia is associated with both a reduced propensity to utilise internal information coupled with poor accuracy of perceiving internal sensations. However, evidence across certain domains (e.g., cardiac) and dimensions (e.g., self-reported awareness of internal sensations) is mixed, with discrepancies possibly due to methodological differences and heterogeneity within alexithymic samples. In this talk I will provide an overview of the evidence linking alexithymia to poor interoception, highlighting important considerations for future research investigating links between bodily and emotional experience.

2:50pm - 3:10pm

Happy infants, parents' brains: Social regulation of allostasis

S. Atzil

Psychology, Hebrew University, Israel

For decades, early bonding with a caregiver is known to be important for improved mental and physical health. A central process to bonding is the provision of sensitive parental care, which is well matched to the infant's needs. Sensitive care is critically important for infant's survival because human infants are helpless in maintaining their on-going physiological requirements of internal milieu for survival and growth, a term known as *Allostasis*. As mammals, human infants cannot live without at least one dedicated caregiver for allostasis: mothers feed their infants to regulate their diet and immune system, sing and touch their infants to regulate their temperature and arousal, and ultimately control many aspects of infants' autonomous nervous system. Accordingly, to survive, infants represent and communicate to the caregivers their interoceptive sensations of allostatic cues (such as hunger, fatigue, and many other physiological needs). We hypothesize that social regulation of allostasis is central to bonding, and mediates the beneficial effects of sensitive parenting. To test this hypothesis, we developed a method to quantify social regulation of allostasis in mother-infant dyads. Moreover, we applied a combined MRI-PET scanner to evaluate the roles of mothers' dopamine responses in mesocortical neural circuits, in her ability to control her infant's allostasis. Together, these data points to allostasis as a central process in bonding, which is supported by a cortico-striatal dopaminergic mechanism in caregivers. This suggests that interoceptive perception of internal milieu, as well as its proper social communication, can be crucial for social bonding development.

3:10pm - 3:30pm

The soothing function of social touch: electrophysiological and pharmacological studies on the social modulation of pain

A. Fotopoulou

Psychology, UCL, United Kingdom

Social touch has important physical and mental health benefits in development and adulthood. The mediating neurophysiological and epigenetic mechanisms are well characterised in non-human animals, but less is known about how social touch attenuates the effects of physical and social threat in humans. We present a set of studies on the role of a specific type of social-affective touch, mediated by the so-called CT neurophysiological system, on the perception of pain, as captured by subjective ratings and early (N1) and later (N2-P2) evoked brain responses to noxious stimuli recorded using EEG (laser-evoked potentials, LEPs). We found that this affective touch (versus neutral touch) from a romantic partner (N = 32), reduced subjective pain ratings and attenuated both N1 and N2-P2 LEPs. While higher-order pain regulation by activity in areas such as the anterior insula and the anterior cingulate cortex has been shown in previous fMRI studies, this is the first study to show early neural modulation of pain by active, partner touch. Interestingly, in previous studies, we found that similar touch by a stranger, where social trust and attachment cannot be assumed, attenuated feelings of social exclusion during the Cyberball paradigm (von Mohr et al., 2017) and also modulated early N1 responses to noxious stimuli but only in interaction with individual attachment style differences (Krahé et al. 2016). We discuss implications for neurophysiological mechanisms of embodied social support, particularly in light of our previous work showing that intranasal oxytocin attenuates similar

neurophysiological responses to pain (Paloyelis et al., 2016).

3:30pm - 3:50pm

The Heartfelt Self: Contrasting the implicit and explicit impact of interoceptive signals on selfand socialawareness

M. Tsakiris[1,2]

[1]Department of Psychology, Royal Holloway University of London, United Kingdom; [2]The Warburg Institute, School of Advanced Study, University of London

Interoception describes the processing and awareness of bodily signals arising from visceral organs, essential for the organism's homeostatic needs. Beyond homeostasis, the integration of exteroceptive and interoceptive signals is required for the coherence of bodily self-awareness. Here we suggest that interoception also plays a critical role in social cognition. Relating to others as individuals who are distinct from one's self requires the simultaneous yet distinct co-representation of self and others. We propose that interoceptive awareness appears to stabilise the mental representation of one's self as distinct from others. In support of this hypothesis we present a series of studies focusing on the explicit and implicit impact of interoceptive signals on a range of social cognition processes, from self-other distinction to emotion perception and the processing and expression of social stereotypes. A more nuanced understanding of the role of interoception in the representation of others in relation to ourselves is vital to determine its importance in social cognition.

Session

Face perception

Time: **Saturday, 21/Jul/2018: 2:30pm - 3:50pm**

Location: **CZ-4**

Session Chair: **Mareike Bayer**

2:30pm - 2:50pm

Face perception investigated with simultaneous EEG-fMRI – The role of emotion, attention, and personal relevance

M. Bayer[1], T. Johnstone[2], I. Dziobek[1]

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We present a series of experiments using simultaneous EEG-fMRI to investigate the interplay of perceptual and higher-level emotional face processing with high temporal-spatial resolution. In a first study, we employed an emotional face-word Stroop task in order to investigate covariations between fMRI activations and ERP components of face processing in 15 subjects, while manipulating sustained attention and transient cognitive conflict. ERP markers of visual processing within 100 ms after stimulus onset showed covariation with brain activation in a large network of extended face processing, including precuneus, posterior cingulate gyrus, and a left lateral parietal-occipital cluster, illustrating the impact of early visual processing on higher-order mechanisms. Crucially, this covariation depended on sustained attentional focus and was absent for incongruent trials, suggesting flexible top-down gating of bottom-up processing. In a second study, we investigated the role of personal relevance on emotional face processing, by using portraits of 22 participants' relevant others and strangers. Results showed increased activation for relevant faces in ERPs (P1, P3), in pupillary responses, and in hemodynamic activation in the face processing network; emotion effects were limited to happy expressions. Taken together, our data show fast attention allocation to faces in general, and to emotional facial expressions and personal relevance in particular, which modulates the engagement of an extended perceptual and emotional processing network. Finally, the interplay of perceptual and higher-order face processing is specifically interesting in autism, as the nature of face processing deficits remains unresolved; and we will present data from an ongoing EEG-fMRI study.

2:50pm - 3:10pm

The contextual influence in the interpretation of facial expressions: A high-density EEG study on the Kuleshov effect.

M. Calbi[1], F. Siri[1], K. S. Heimann[2], D. Barratt[3], V. Gallese[1,4], M. A. Umiltà[5]

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During everyday interactions, facial expressions are perceived in a wide context consisting in emotional body language, the surrounding environment and our intentions and expectations. Although previous studies have shown significant behavioural effects demonstrating the context-sensitivity of emotions, little has been done to explore such contextual modulations on facial expressions processing at a physiological level. This study precisely fits in this gap by employing an original paradigm based on the cinematographic "Kuleshov effect". High-density EEG was recorded while participants watched film sequences consisting in three shots: the close-up of a target person's neutral face (Face1), a view of the emotional context (happy, fearful or neutral), followed by another close-up of the same target person's neutral face (Face2). The task was to rate both valence and arousal, and subsequently to explicitly categorize, the target person's emotion. We focused on Face2 processing and, more specifically, on Late Positive Potential (LPP) time window. Results showed LPP of higher amplitude in response to neutral faces in emotional contexts than to neutral faces in neutral contexts. This modulation was mainly detected in regions related to emotional facial expressions processing. Behavioural results confirmed the presence of a significant effect in terms of both valence and arousal. Moreover, participants categorized the target person's emotion congruently with the preceding context. In conclusion, our results shed new light on the comprehension of neural and temporal correlates underpinning the context-sensitivity of facial expression of emotions.

3:10pm - 3:30pm

Design and implementation a fuzzy classifier for detecting the emotions of autistic children

M. Naeeni Davarani, A. Arian Darestani

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The study of emotions has always been a matter for philosophers and psychologists. A complete process of face detection involves three steps that include face detection, feature extraction, and cognition. We tried to focus on all three stages as main focus of this paper. To identify facial expressions in eight states (neutral, anger, ridicule, hate, fear, happiness, sadness and surprise), Cohn dataset is used and then the pre-processing is considered to identify the face box. Using the LBP algorithm, the edges of face lines will be determined. The obtained dimensions from the algorithm LBP are reduced by PCA. The simulation results show that by reducing the dimensions, accuracy has considerable improvement in three-layer Perceptron Neural Network. The accuracy rate in the neural network, without PCA is equal to 37.72 due to limited data and abounding features; and by applying PCA, the accuracy will be 86.61 in the three-layer Perceptron neural network. The simulation results with the neural-fuzzy network also show that if a more complicated network is used for a linear problem, it will not work efficiently because the accuracy rate of the neural-fuzzy network is equal to 76.51%, which is about 10% lower than the three-layer perceptron neural network.
Finally, a system with accuracy of 72.50 will be implemented for classifying autistic children using the healthy children and autistic Children's Database.

3:30pm - 3:50pm

Does viewing one face prime interpretation of the next? The effects of emotion and gender

M. J. Davis, F. Maratos

College of Life and Natural Sciences, Psychology, University of Derby, England

Interpreting what affects our perception and appraisal of the faces of others is central to our understanding of how we behave in social situations. Recent neuroimaging research has found that after viewing emotionally arousing images heightened reactions in the amygdala persist, and potentially bias the perception of subsequent unrelated neutral images. Similarly, behavioural research has demonstrated priming effects of gender on neutral facial stimuli. Considering this, the aim of the present research was to investigate the combined effects of emotion and gender priming on the appraisal of a subsequent emotion-neutral androgynous face. To explore this, 30 male and 30 female individuals participated in a mixed-measures experiment, in which they were asked to assign gender and emotion ratings to an emotion-neutral androgynous face after viewing a dynamic emotional (angry, happy) and gendered (male or female) face. We found four main results. That is, following the presentation of: i) a happy dynamic face, the subsequent face was more likely to be interpreted as both more arousing and more feminine; ii) an angry dynamic face the subsequent face was more likely to be perceived as less pleasant; iii) a female dynamic face the subsequent face was more likely to be perceived as female. Finally, male participants were more likely to rate the subsequent face as displaying higher levels of arousal per se. These findings provide a greater understanding of how first impressions can influence subsequent appraisals, and are consistent with current understanding of the brain basis of emotional priming.

Session

Decision making

Time: **Saturday, 21/Jul/2018: 2:30pm - 3:50pm**

Location: **CZ-5**

Session Chair: **Eliana Vassena**

2:30pm - 2:50pm

A good news and a bad news, which one do you want first? The importance of the sequence and the organization of information for a financial decision-making: A neuroelectrical imaging study

W. yang[1], J. Ma[1], M. Bonaiuto[2], A. G. Maglione[3], E. Modica[3], D. Rossi[3], G. Cartocci[3], F. Babiloni[3]

[1]Department of Psychology and behavioral science, Zhejiang university, China, People's Republic of; [2]Department of Psychology of Development and Socialization Processes, Sapienza University of Rome, Rome, Italy; [3]Department of Molecular Medicine, Sapienza University of Rome, Rome, Italy

Investment decisions are largely based on the information investors received from the target firm. Thaler(1985) suggests that integration/segregation of information influence individual's perceived value. Meanwhile, when evaluating evidence and information in a sequence, order effect and biases have been found in various areas.The purpose of research is to investgate the influence on individual's decision when given information in different organization(either segregate/integrate) and sequence(either in the order of Negative-Positive/Positive-Negative).Three groups of information are tested: a piece of Big Positive information and a piece of Small Negative information (BP/SN); a piece of Big Negative information and a piece of Small Positive (BN/SP); and a piece of Small Positive information and a piece of Small Negative information (SP/SN). Apart from behavioral result,study applied the gathering of the electroencephalographic rhythms variations, heart rate and galvanic skin response.The neurometric indicators here employed were the Approach-Withdrawal (AW) and the Emotional (EI) indexes. In all three groups of informationn behavioral results confirms recency effect. In SP/SN, AWI consistent with the behavioral results and shows recency effect. However, when receiving information in large scale, either big positive or big negative, emotion plays a role during decision-making. In both case of BP/SN and BN/SP, emotion is effected by organization of information. In the condition of BP/SN, neurometrics AWI result suggests more approach tendency when two pieces of information presented integrated. While in the case of BN/SP, we observe the influence of both order and organization. Individual favours separation of information with the order of Negative-Positive, the recency effect.

2:50pm - 3:10pm

Age differences in neural correlates of feedback processing after economic decisions under risk

C. Fernandes[1,2,3], R. Pasion[1], A. Gonçalves[1], F. Ferreira-Santos[1], F. Barbosa[1], I. P. Martins[3], J. Marques-Teixeira[1]

[1]Laboratory of Neuropsychophysiology, Faculty of Psychology and Education Sciences, Portugal; [2]Faculty of Medicine, University of Porto, Porto, Portugal; [3]Language Research Laboratory, Institute of Molecular Medicine, Faculty of Medicine, University of Lisbon, Lisbon, Portugal

Aging affects economic decision-making, which has several negative implications. However, the neural mechanisms underlying age-related differences in decision-making are still scarcely known. This study examines age-related differences in behavioral responses to risk and in the neurophysiological correlates of feedback processing. Thirty younger, 29 middle-aged and 29 older adults were asked to decide between two risky options, in the gain and loss domains, during an EEG recording. Results evidenced group-related differences in early and later stages of feedback processing, indexed by differences in the feedback-related negativity (FRN) and P3 amplitudes. Specifically, in the loss domain, younger

adults showed higher FRN amplitudes after non-losses than after losses, whereas middle-aged and older adults had similar FRN amplitudes after both. In the gain domain, younger and middle-aged adults had higher P3 amplitudes after gains than after non-gains, whereas older adults had similar P3 amplitudes after both. Behaviorally, older adults had higher rates of risky decisions than younger adults in the loss domain, a result that was correlated with poorer performance in memory and executive functions. Our results suggest age-related differences in the outcome-related expectations, as well as in the affective relevance attributed to the outcomes, which may underlie the group differences found in risk-aversion.

3:10pm - 3:30pm

Learning to balance fairness and self-interest: A reinforcement learning account

M. R. Giffin[1], M. Lebreton[2], J. Gross[1], C. De Dreu[1,2]

[1]Psychology, Leiden University, Netherlands, The; [2]Economics, University of Amsterdam, Netherlands, The

While norms often act as useful heuristics, norms sometimes prevent the exploration of valuable courses of action. In the current study we combined computational modeling, the ultimatum game, and fMRI to explore the behavioral and neural correlates that accompany circumstances in which social norms impede optimal decision-making. The ultimatum game is a dyadic paradigm in which one player, the proposer, decides how much of an endowment to offer a responder, who decides whether to accept the offer, in which case the endowment is divided as proposed, or reject the offer, in which case both parties receive nothing for that trial. We examined the behavior and neural activity of proposers playing against groups of responders with different acceptance functions as well as computer generated lotteries programmed to mimic human behavior. Our goals were (i) to assess whether or not proposer behavior and neural activity could be captured with a reinforcement learning framework, and (ii) to see if this learning process differed between social and non-social conditions. Using a novel reinforcement learning algorithm, we found proposer behavior to be governed by subjective representations of the opponents' acceptance thresholds. Specifically, we found that proposers learned the slope and intercept of each opponent's acceptance logistic function, which mapped the investment amount into a victory or a defeat. We furthermore found that learning differed between the social and non-social conditions, with subjects learning faster in the non-social condition, and exhibiting an apparent reluctance to explore the acceptance range of the opponents in the social condition.

3:30pm - 3:50pm

Prioritizing reward over cost information affects decision-making and task-performance: Evidence from behaviour and computational modelling.

E. Vassena[1,2], M. Blasco Oliver[1,2], W. H Alexander[2,3]

[1]Donders Center for Cognitive Neuroimaging, Donders Institute for Brain, Cognition and Behaviour, Netherlands, The; [2]Department of Experimental Psychology, Ghent University, Belgium; [3]Center for Complex Systems & Brain Sciences, Florida Atlantic University, Boca Raton, FL, USA

Efficient integration of complex environmental information is critical in goal-directed behavior. Motivational information regarding potential rewards and costs (such as risk or required effort) affects decisions whether to engage in a task, and impacts performance accuracy. While it is generally acknowledged that costs and benefits are integrated to guide choices and performance, it remains an open question as to how this integration occurs. Computational models of high-level cognition postulate serial processing of task-relevant features, and demonstrate that enforcing a specific order of processing can affect performance. In this study we investigated the hypothesis that motivationally-relevant task features (cost and benefit information) may also be processed serially, and that prioritizing reward or cost (by manipulating order) may (i) alter the willingness to choose riskier or more effortful options, and (ii) improve performance accuracy. In three experiments, we manipulated order of presentation of risk and reward cues (in a gambling task, exp1) and effort and reward cues (in an effort-based decision-making and performance task, exp 2-3). Furthermore, we simulated the tasks with a recent model of higher-level information-processing in prefrontal cortex (Alexander & Brown, 2015). Model predictions were in line with empirical data: manipulating order of cost and benefit cues strikingly affected choice rates (exp 1-2) and performance accuracy (exp 3). These results pinpoint the importance of controlling order of processing of motivational cues in neuroimaging studies, and question neuroeconomic accounts, which do not predict differences in perceived utility as a function of whether reward or cost information is prioritized.

Session

SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off

Time: *Location:* **CZ-1**

Saturday, 21/Jul/2018:
4:10pm - 5:50pm

Organizer(s): **Zsuzsika Sjoerds & Kerstin Fröber**

Healthy behavioral control ideally involves balancing a trade-off between two seemingly opposing control processes. On the one hand persistent, or stable action tendencies help to remain representation of goals and associated actions, to reduce distraction and to remain focus. On the other hand flexible action control involves consideration of the environment and alternative goals, for easy adjustment in changing environments. Such a persistence-flexibility trade-off is the center of a large body of neurocognitive research, and fully characterizing its behavioral and neural mechanisms will provide insight into the processes when the control balance is off, as is for instance thought to be part of the pathophysiology in many psychiatric disorders. In this symposium we will approach the persistence flexibility trade-off from multiple angles, from methodological and behavioral points of view, towards neuromodulatory and computational mechanisms. We will introduce the persistence versus flexibility trade-off in light of the metacontrol state model. Next, we will discuss voluntary task switching as a major tool in investigating the trade-off under scrutiny. Metacontrol policies involving flexible and persistence balancing will be discussed, and how context can shift the policy balance towards one end of the continuum. Furthermore, we will discuss the relationship between control mode and working memory, and in particular how different component processes of working memory are related to control mode. Afterwards, we will focus on neuromodulatory systems, specifically the dopaminergic system, and its role in cognitive control.

4:10pm - 4:30pm

Flexibility versus persistence: a metacontrol state model

Z. Sjoerds[1,2], R. Sellaro[1,2], A. Trutti[1,2], V. Mekern[1,2], B. Hommel[1,2]

[1]Institute of Psychology, Leiden University, The Netherlands; [2]Leiden Institute for Brain and Cognition, Leiden University, The Netherlands

Behavioral control involves balancing between two seemingly opposed control processes of which multiple analogies are center to a large body of cognitive science. The metacontrol state model (MSM, Hommel 2015) proposes a trade-off between persistence and flexibility. This novel account hypothesizes that persistent action tendencies involve top-down maintenance and strong competition, or inhibition, between goal representations in order to remain focused on one task. In contrast, flexible action control requires a broader consideration of the environment and alternative goals for easy adaptation in changing, or uncertain, environments. The full representation of the behavioral and neural mechanisms underlying the persistence-flexibility trade-off will provide crucial insights into the involved processes, and help characterize maladaptive control, as proposed to be center to pathophysiology in multiple neurological and psychiatric disorders. In this introductory talk of the session I will introduce persistence and flexibility according to the MSM.

4:30pm - 4:50pm

Voluntary task switching as a tool to investigate the flexibility-stability balance

K. Fröber, G. Dreisbach

Experimental Psychology, University of Regensburg, Germany

Goal-directed action in a constantly changing environment requires an adaptive balance between cognitive stability and flexibility. To investigate this balance the task switching paradigm is often used because task repetitions are associated with stability, whereas task switches are associated with flexibility. In this talk, we propose that the voluntary task switching paradigm and the measure of the spontaneous voluntary switch rate (VSR) is especially well suited to investigate this balance, because it provides a relatively direct measure of flexibility versus stability. Task switching is associated with robust performance costs - switch costs -, which is why it is not surprising that participants barely switch tasks voluntarily when switching is truly optional. So, there seems to be a natural tendency to avoid switch costs resulting in a bias towards stability as indicated by a rather low VSR. But, theoretically, manipulations aimed at promoting cognitive flexibility should result in an increase in VSR. Several experiments from our lab using a hybrid task switching paradigm combining both forced- and free-choice trials recently confirmed this prediction. For example, increasing the frequency of forced task switches in forced-choice trials also increased the frequency of voluntary switches in free-choice trials. Thus it seems as if VSR is indeed a perfect indicator to track modulations of flexibility versus stability. These findings will be discussed with respect to current theories on the flexibility-stability balance.

4:50pm - 5:10pm

Shifting the balance: The role of context in shaping metacontrol policies.

R. van Dooren, I. Vergari, R. Sellaro, B. Hommel

Cognitive Psychology Unit, Leiden University, Netherlands, The

According to the Metacontrol State Model, human behavior can be described in terms of two counteracting systems: one promoting persistence and the other promoting flexibility. The ability to shift the balance between these two opposing systems is referred to as metacontrol. Interestingly, metacontrol states have been observed to be quite flexible and can change as a function of both long-term (e.g., genetic profile, religious and cultural background) and short-term factors (e.g., mood, meditation). In this talk, I will present evidence showing that metacontrol states, once established, can be bound to environmental cues and re-activated later on by the mere presentation of these cues. These findings confirm and extend previous observations by providing further insight into the variety of factors that are capable of shifting the persistence-flexibility balance towards one or the other dimension.

5:10pm - 5:30pm

Effects of persistent vs flexible control mode on working memory

B. J. Jongkees[1], Y. Kessler[2], G. Dreisbach[3], L. S. Colzato[1]

[1]Cognitive Psychology, Leiden University, Netherlands, The; [2]Department of Psychology and Zlotowski Center for Neuroscience, Ben-Gurion University of the Negev, Israel; [3]Department of Psychology, University of Regensburg, Germany

Cognitive control requires an adaptive balance between (i) a persistent control mode that shields goal representations from distraction, and (ii) a flexible control mode that allows adaption to changes in goals or the environment. These opposing control demands are exemplified in working memory (WM), which requires both robust maintenance and shielding of information against distraction but also flexible updating when information becomes outdated or environmental demands change. Although it is possible that a bias toward persistence facilitates the maintenance but hinders the updating component of WM, existing research is burdened by an inability to measure component processes of WM in isolation. In this talk I present findings that begin to tackle this issue by using the novel reference-back paradigm to disentangle component processes such as maintenance, updating, and selective gating of information to WM. In particular, I will demonstrate the utility of the reference-back paradigm by showing that behavioral costs of updating WM representations, gate opening, and gate closing—although often correlated—are affected in different ways by cognitive control mode.

5:30pm - 5:50pm

Dopamine and decisions about cognitive control

R. Cools

Psychiatry, Radboudumc, Netherlands, The

Failures of cognitive control are common. Why do we so often fail to exert cognitive control? Classic (prefrontal) models of cognitive control address our ability to implement control. Recent advances have shifted the question to how we decide whether to recruit cognitive control. This involves re-conceptualizing cognitive control as a cost/benefit-based decision instead of an ability of implementation. I will review evidence that dopaminergic drugs like methylphenidate alter cognitive control, not just by modulating the ability to implement cognitive control, but also by biasing cost/benefit decision making about whether or not to exert cognitive control.

Session

SYMPOSIUM - How motivational and learning processes shape pain and avoidance

Time: *Location:* **CZ-2**

Saturday, 21/Jul/2018:
4:10pm - 5:50pm

Organizer(s): **Marta Andreatta & Marieke Jepma**

Although the sensation of pain often signals impending bodily harm, there is no one-to-one relationship between pain and (potential) tissue damage. Instead, a large body of evidence suggests that pain perception can be strongly modulated by contextual, motivational and learning factors, such as the (un)expectedness of, and the meaning attributed to painful sensations. Furthermore, both pain and pain relief are important teaching signals that drive escape and avoidance. This symposium will spotlight the work of five researchers studying the behavioral and neural mechanisms through which pain is shaped by the context and drives learning. Speaker 1 (Leknes) will discuss the opioid and BOLD mechanisms underlying the suppressive effect of a relief-associated context on pain perception. Next, Speaker 2 (Vlaeyen) will address the role of fear in pain and avoidance, presenting experimental data from both healthy and chronic-pain populations. Speaker 3 (Koban) will examine the modulation of pain by learned predictive cues, focusing on its generalization based on perceptual and conceptual similarity. Speakers 4 and 5 will focus on pain-related learning. Speaker 4 (Jepma) will present evidence that unexpected pain and unexpected pain absence drive avoidance learning via separate neural pathways. Speaker 5 (Andreatta) will then address the distinction between pain and relief learning at the behavioral level using virtual reality.

4:10pm - 4:30pm

Opioid and BOLD mechanisms of how relative relief cues shape the pain experience

S. Leknes[1], C. Berna[2], I. Tracey[2]

[1]Psychology, University of Oslo, Norway; [2]University of Oxford, Oxford

Knowing that "it could be worse" can improve feelings towards a present misfortune. We used relative relief cues to modulate the experience of moderate heat pain in two studies. In Study 1, we collected physiological, BOLD signal and subjective ratings, and showed that when moderate pain was the best possible outcome and co-occurred with a relative relief cue (the alternative, expected outcome was intense pain), ratings of pain affect improved significantly, along with an increase in BOLD signal in medial orbitofrontal and ventromedial prefrontal cortices. Furthermore, the change in outcome hedonics correlated with activity in the periacqueductal grey (PAG) of the descending pain modulatory system (DPMS). The context manipulation also significantly increased functional connectivity between reward circuitry and the PAG, consistent with a functional change of the DPMS due to the altered motivational state. Accordingly, we hypothesized that the effect of relative relief cues would be opioid-mediated. To test this, Study 2 used a double-blind, placebo-controlled intravenous naloxone versus saline cross-over design. The relative relief effect was replicated for both pain pleasantness and pain intensity ratings in the saline condition, but could not be detected when endogenous opioid signaling was blocked with naloxone. I will discuss these findings in light of the current literature on pain-pleasure interactions and pain expectations.

4:30pm - 4:50pm

Pain, fear and avoidance

J. Vlaeyen

Health Psychology, KU Leuven, Belgium

Pain is a biologically relevant and vital signal of bodily threat, urging the individual to protect him/herself. Immediate protective responses to pain include increased arousal, orientation to the sources of threat, and various safety-seeking behaviors including escape and avoidance behavior. These protective responses are usually followed by restorative ones including withdrawal and diminished activity levels. Despite this biologically hard-wired system, there are individual differences in how pain is interpreted as threat, and the expression of pain usually is dependent on social context variables and current goals. Also, learning takes place rapidly. In order to facilitate early and effective protection against bodily threat, previously neutral cues that somehow are causally or functionally related to pain can receive the propensity to elicit the expectancy of pain or pain increase, fostering anticipatory protective responses. In this contribution, Johan W. S. Vlaeyen will present experimental data in healthy participants and individuals with chronic pain showing that pain-related fear (1) can be a learned response, not only via direct experience but also via observation and verbal instruction, (2) easily generalizes to perceptually and conceptually similar events, (3) evokes observable avoidance behavior, that paradoxically increases fear (and pain) rather than reducing it, and that can be modulated by motivation context (4) extinguishes through modern expectancy violation techniques.

4:50pm - 5:10pm

Generalization of learned pain modulation

L. Koban, T. D. Wager

Institute of Cognitive Science, University of Colorado Boulder, United States of America

The experience of pain is strongly influenced by a variety of contextual and cognitive factors, including learning from previous experiences. Pain is typically perceived as more intense when preceded by a conditioned cue (CS_{HIGH}) that has previously been associated with higher pain intensities, compared to cues associated with lower intensities (CS_{LOW}). However, how conceptual processes contribute to learning and generalization of pain is less known. In three behavioral and one fMRI study (total N=170), we tested whether *learned pain modulation* generalizes to perceptually similar cues (Studies 1 and 2) and conceptually similar cues (Studies 3 and 4). The results showed that participants reported higher pain when heat stimulation was preceded by novel stimuli that were either perceptually (Studies 1 and 2) or conceptually (Studies 3 and 4) similar to the previously conditioned CS_{HIGH}. Across all three studies, the strength of this generalization effect was strongly correlated with individual differences in explicitly learned expectations. Together, these findings suggest an important role of conscious expectations and higher-order conceptual inference during generalization of learned pain modulation. We discuss implications for the understanding of placebo and nocebo effects as well as for chronic pain and anxiety.

5:10pm - 5:30pm

How pain and avoided pain drive learning: Two separate brain systems for pain-avoidance learning?

M. Jepma[1], M. Roy[2], A. Dahan[3]

[1]University of Amsterdam, Department of Psychology, The Netherlands; [2]McGill University, Department of Psychology, Canada; [3]Leiden University Medical Center, Department of Anesthesiology, the Netherlands

Learning to predict and avoid impending harm is critical for survival. Previous studies have provided a wealth of evidence about the computational and neural mechanisms of reward-driven learning, pointing to a key role for the dopaminergic system in encoding reward prediction errors (actual minus expected rewards) that drive learning of reward-pursuit responses. However, relatively little is known about how primary aversive outcomes, such as pain, drive avoidance learning. Importantly, both unexpected pain and the unexpected absence of pain—'aversive' and 'appetitive' pain prediction errors, respectively—are relevant teaching signals guiding avoidance behavior. We examined the brain circuits encoding both types of prediction errors, using an instrumental pain-avoidance learning task combined with fMRI and pharmacological manipulations of the opioid and dopamine systems (N = 74). Using an axiomatic approach, we found that aversive pain prediction errors were encoded in a network including the periaqueductal gray and anterior cingulate cortex, while appetitive pain prediction errors were encoded in frontoparietal, somatosensory, and frontopolar regions. Separate analyses of pain and avoided-pain trials revealed that prediction errors for these two outcome types are encoded in largely separate brain circuits. Furthermore, effects of our pharmacological manipulations suggest specific roles for the opioid and dopamine systems in the appetitive component of pain avoidance learning. Our results suggest that pain-avoidance learning can be accomplished via two different neural pathways, promoting the 'avoidance of pain' and 'seeking of pain absence', which may increase the resilience of this vital function.

5:30pm - 5:50pm

Behavioral responses elicited by pain vs. relief learning

M. Andreatta, F. Kavcioglu, D. Gromer, P. Pauli
Department of Psychology, University of Wuerzburg, Germany

Termination of pain elicits an appetitive response called relief. Human studies demonstrated appetitive physiological (startle attenuation) and neuronal (striatum activation), yet aversive cognitive (negative ratings) responses to relief-associated stimuli. Here, we investigated how individuals would behaviorally respond to a relief-associated stimulus. Twenty-three participants underwent both pain and relief learning in a cave automatic virtual environment. During pain learning (Day1), participants freely moved throughout one virtual office (fear context) in which two colored lights were turned on and off, alternatively. At the offset of one light (conditioned stimulus, $_{fear}$CS+) an electric shock (unconditioned stimulus, US) was delivered, but never at the offset of the other light ($_{fear}$CS-). During relief learning (Day2), participants freely moved into another office (relief context) in which two different lights were turned on and off. To associate a specific light with relief, the painful US was delivered 6 sec before the onset of one light ($_{relief}$CS+), but never before the other light ($_{relief}$CS-). Results showed aversive ratings (negative valence, high arousal and probability of US) and slightly less walked distance (freezing) for $_{fear}$CS+ vs. $_{fear}$CS-. This indicates successful pain learning. Discriminative learning in the relief context was not observed. Possibly, participants associated the US with the context, while the lights were additional components of the room. Interestingly, the higher participants' anxiety sensitivity was, the less distance they walked in the relief context. In conclusion, our results suggest two distinct learning processes for pain and relief.

Session

SYMPOSIUM - Reinforcement learning in a social world

Time: **Saturday, 21/Jul/2018: 4:10pm - 5:50pm** *Location:* **CZ-3**

Organizer(s): **Björn Lindström & Philip Pärnamets**

The social world is central for human behavior. By its very nature, it is dynamic: both the behavior and attitudes of others can change. Adaptive social behavior therefore requires powerful mechanisms. Reinforcement learning, where the agent updates future expectations based on past rewards and punishments constitutes such a mechanism. Understanding when and how computational and neural reinforcement learning mechanisms shape both beneficial and maladaptive aspects of social behavior is therefore paramount. This symposium addresses this question by discussing how a set of basic learning mechanisms can help explain a wide variety of social behaviors. To this end, the symposium will discuss the role of reinforcement learning mechanisms for the development of social group structure and trust in interactive social behavior, such as economic games, and highlight mechanistically-based interventions to improve social outcomes. The symposium will also discuss how social reinforcement learning and social motivations interact, and how empathy can function as a reinforcer of prosocial behaviors. Furthermore, the neural reinforcement learning mechanisms underlying the crucial social issue of property rights – what belongs to oneself and what to others –will be discussed. Together, the different parts of the symposium will highlight how the same set of basic, well-understood reinforcement learning mechanisms contributes to a multitude of social behaviors, and how these mechanisms can be utilized to promote positive social outcomes.

4:10pm - 4:30pm

Reinforcement learning creates ostracism in social groups

B. Lindström, P. Tobler
Department of Economics, University of Zürich, Switzerland

Ostracism, or social exclusion, is widespread and associated with a range of detrimental psychological and social outcomes. Ostracism is typically explained as a type of instrumental punishment of free-riders or deviants. However, this instrumental account fails to explain many features of real-world ostracism, including its prevalence. We hypothesized that ostracism can emerge incidentally (non-instrumentally) when people choose partners in social interactions, and that this process can be explained by simple reinforcement learning (RL) mechanisms. We tested this radically different explanation of ostracism in four experiments (n = 456) with Prisoner's Dilemma and coordination games on dynamic social networks. Contrary to the instrumental account of ostracism, we find that the targets of ostracism are not primarily free-riders. Instead, random initial variability when people choose partners for social interactions predicts later ostracism better than the instrumental punishment account (Experiment 1), and occurs also in situations where free-riding is not even possible (Experiment 2). Using computational agent-based modeling and comparison, we show that simple RL mechanisms explain the incidental emergence of ostracism, and that they do so better than a formalization of the instrumental account. Finally, we leveraged these

RL mechanisms to experimentally reduce the emergence of incidental ostracism (Experiments 3-4). Together, these results shed new light on ostracism and its underlying computational basis, by demonstrating that ostracism is more incidental than previously assumed and can arise from basic forms of learning. They also show how the same RL mechanisms that cause incidental ostracism can help to reduce its emergence.

4:30pm - 4:50pm

From trust in groups to trust in individuals

P. Pärnamets[1,2], T. Granwald[2], A. Olsson[2]

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Trust is fundamental to prosocial behavior. Recent work has begun to address how trust evolves during repeated interactions with single individuals. Here we extended this approach and examined how participants first learn about the relative trustworthiness of social groups, and then how they used that knowledge when meeting novel individuals belonging to those groups. Participants completed a two-part experiment where they first played repeated trust games with multiple members of two, arbitrary groups; one trustworthy and one untrustworthy. Participants readily learned to differentiate the two groups. We fit a reinforcement learning model to the participants' trust decisions, finding that a model which also included a bias term increasing the expected value of reciprocation best fit the data. In the second part of the experiment, participants interacted repeatedly with four new members from the two groups. Two members, one from each group, acted congruently with their group's previous behavior while the other two acted incongruently. Participants were largely unaffected by their expectations based on group membership and instead adapted quickly to the partners actual behavior. The bias term from the RL model predicted participants initial behavior better than their expectations based on group membership. Together we find that individual's pro-social tendencies and individuating information can overcome knowledge about group belonging.

4:50pm - 5:10pm

Social learning and social motivation

G. Hein

Translational Social Neuroscience, University of Würzburg, Germany

Social motives such as empathy drive social behaviors. Therefore it is crucial to understand the processes that can alter social motivation. In my talk I will present evidence that shows how classical reinforcement learning mechanisms interact with the neural processing of social motives such as empathy, and how learning from outgroup behavior can help to overcome ingroup favoritism in different settings. Together, the findings highlight that classical learning models are a promising approach for explaining complex social motivational states and behaviors.

5:10pm - 5:30pm

Associative learning of self and other ownership

P. L. Lockwood[1], M. Wittmann[1], M. Apps[1], M. Klein-Flugge[1], M. Crockett[1,2], G. Humphreys[1], M. Rushworth[1]

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Sense of ownership is such a fundamental aspect of human cognition that it influences the grammar of many human languages. For example, words are changed and used in special ways such as the genitive case or the construct state to indicate the ubiquitous association that constitutes the ownership relationship. More specifically, social environments often require that we distinguish what in the world is "ours" and what belongs to other people. However, the mechanisms that underpin how we acquire a sense of ownership over objects that are ours and others is unknown. Here we used an associative learning task, model-based functional magnetic resonance imaging and a minimal ownership paradigm to probe the behavioural and neural mechanisms underpinning ownership acquisition for ourselves, friends and strangers. We find a self-ownership bias at multiple levels of behaviour from initial preferences to reaction times and computationally defined learning rates. Several areas within medial prefrontal cortex tracked ownership associative strength between objects and agents. Ventromedial prefrontal cortex and anterior cingulate (ACC) sulcus responded more to self vs. stranger associations but despite a pervasive neural bias to track self-ownership, no brain area tracked self-ownership exclusively. However, ownership prediction errors for strangers were specifically coded in ACC gyrus and value representations in this area were tracked only for friends and strangers but not oneself. Core neural mechanisms for associative learning are biased to learn in reference to self but also engaged when learning in reference to others. In contrast, ACC gyrus exhibits relative specialization for learning about others.

5:30pm - 5:50pm

The role of empathy in learning to avoid harm to others

I. Patil, S. Campbell, W. Kool, M. Cikara, F. Cushman

Department of Psychology, Harvard University, United States of America

Reinforcement learning (RL) provides a formal computational framework that captures the operating principles of two distinct systems long known by psychologist to guide choice behavior: a habitual or "model-free" system that is fast and requires less effort but is also less accurate, and a goal-directed or "model-based" system that is more effortful and computationally demanding but also more accurate. In the current work, we utilize this framework to study how people learn to maximize "moral" rewards—i.e., the reduced suffering of others. Specifically, we ask does empathy exert its effects on behavior principally through the goal-directed planning system, suggesting that people reason explicitly about the consequences of their behavior? Or, does empathy lead to a more automatic, internalized, model-free aversion to actions that typically cause harm? In the current study, we create a new "moral" version of the two-step task with painful facial expression as the reinforcer and compare it to two non-social two-step tasks (reinforcer: points earned). Our results reveal that empathic learning relies more on the model-free or habitual system. Specifically, participants in the two non-social tasks (used as controls) showed increased model-based choices compared to the moral task. Additionally, we found that a substantial portion (38%) of participants in the moral condition appeared to maximize the amount of pain inflicted on the faces (rather than minimizing it). The reliance on model-based control for these pain-maximizing participants ("sadists") was much higher than the remaining participants (62%, "empathizers"). These findings shed light on computational foundations of moral learning.

Session

Memory

Time: **Saturday, 21/Jul/2018: 4:10pm - 5:50pm**

Location: **CZ-4**

Session Chair: **Conny Quaedflieg**

4:10pm - 4:30pm

Intentional mnemonic control under stress

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To some extent, we can all choose what to remember and what to forget. This intentional mnemonic control can break down when stressed. Stress is known to modulate memory processes and stress-related disorders are characterized by deficits in mnemonic control. Mnemonic control involves fronto-hippocampal connections in the brain and oscillations of alpha (10Hz) and theta (6Hz) frequencies. We investigated the impact of acute stress on intentional mnemonic control and its neuronal correlates. After learning neutral cue-target pairs, we induced acute stress in 66 healthy volunteers using the imaging Trier Social Stress Test. Sixty minutes after stress induction, participants repeatedly either recalled (think) or suppressed (no-think) the thoughts of previously learned target memories upon reminder cues (T/NT task) while magnetoencephalographic data were recorded. Cortisol and blood pressure measured before and after the stress task as well as before and after the T/NT task. We hypothesized that compared to a no-stress control condition 1) stress will enhance positive mnemonic control paralleled by enhanced synchronisation in the theta and gamma frequency band and cross-frequency coupling between frontal theta phase and posterior gamma power for think items and 2) stress will impair negative mnemonic control paralleled by less reduction in theta power in the MLT and long-range theta-gamma synchronisation for no-think items. Behavioral results and frequency analyses will be presented.

4:30pm - 4:50pm

Individual differences in working memory performance: An EEG study

Y. G. Pavlov, N. V. Pavlova

Institute of Medical Psychology and Behavioral Neurobiology, University of Tuebingen, Germany

Despite the growing interest to the working memory (WM) in last decades all existing neuroimaging studies have at least one limitation for investigation of individual differences in WM performance. In order to overcome these limitations, 156 subject were participating in solving highly demanding WM tasks which gave us the opportunity to distinguish EEG activity of individuals with different levels of WM performance. Additionally, using two types of tasks, which required either only retention of stimulus set or manipulation of content, we revealed EEG correlates of temporary storage and central executive components of WM and assessed their contribution to individual differences. The study showed striking individual differences in dynamics of frontal midline theta activity especially in the manipulation condition. Based on these results the second experiment was conducted. Twenty-two healthy adults participated in two testing sessions (after sham and transcranial alternating current stimulation (tACS)). tACS was applied for 20 min over Fpz and CPz at 6 Hz, 1 mA. No after-effects of tACS were observed in the stimulation sessions as compared to sham. The data suggest that tACS delivered before the WM task is not able to produce any observable changes in WM performance. Future studies could apply simultaneous stimulation and EEG recording during maintenance of information in WM for better understanding of the theta tACS effects.

4:50pm - 5:10pm

Molecular substrates of recent vs. remote memory recall

P. Ghazal

department of Biosciences, Comsats institute of information technology, Pakistan

It is now established that iteration of memory circuits takes place from hippocampus to cortical regions. The recall of recent event is largely dependent on the hippocampal networks, however, with passage of time, the cortical regions become largely involved in the recall of remote events. Molecular events, especifically, the AMPA receptor regulation underlying this iteration remains largely elusive. Therefore, in this study we used contextual fear conditioning paradigm to investigate AMPA receptor trafficking in recent vs remote memories. We observed endocytosis of GluA1 and 2 exclusively in the anterior cingulate regions in the remote memory group, one hour post retrieval session, whereas in recent group, endocytosis of AMPA receptor units was only observed in the hippocampal regions. The endocytosis of GluA1-2 containing AMPARs upon retrieval, showed the weakened state of synapse. At this time point modification in content and strength of memory is possible, hence, based on these results .we propose one-hour post retrieval to be the window period for the treatment of aberrant memories.

5:10pm - 5:30pm

Post-error brain activity correlates with incidental memory for negative words

M. Senderecka[1], M. Ociepka[2], M. Matyjek[3], B. Kroczek[2]

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The first aim of the study was to evaluate whether short-duration affective states induced by negative and positive words can lead to increased error-monitoring activity relative to a neutral task condition. The second aim was to assess whether post-error brain activity can support incidental semantic memory for negative and/or positive words. Fifty-eight participants (33 females, mean age 23.4 years) performed an emotional stop-signal task that required response inhibition to negative, positive or neutral nouns while EEG was recorded. Immediately after the completion of the task, they were instructed to recall as many of the presented words as they could in an unexpected free recall test. We observed significantly greater brain activity in the error-positivity (Pe) time window in both negative and positive trials. Increased processing of negative and positive words was reflected in better incidental recall. Importantly, the memory performance for negative words was positively correlated with the Pe amplitude in general and with the Pe amplitude in the negative condition in particular. The source localization analysis revealed that the subsequent memory recall for negative words was associated with widespread bilateral brain activity in the dorsal anterior cingulate cortex and in the medial frontal gyrus, which was

registered in the Pe time window during negative trials. The results of our study indicate that the emotional enhancement of error monitoring may be induced by stimuli with symbolic, ontogenetically learned emotional significance. They also suggest that post-error activity of the medial prefrontal cortex may selectively correlate with incidental memory for negative material.

5:30pm - 5:50pm

How disgust and fear influences long-term memory of verbal unitizations – Measuring encoding-retrieval similarity with fMRI.

M. Riegel[1], M. Wierzba[1], M. Wypych[1], K. Jednoróg[2], A. Grabowska[2], A. Marchewka[1]

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Emotion-memory interactions are present from encoding to long-term retrieval. However, little is known about the influence of specific basic emotions on the reinstatement of encoding-related activity during retrieval. 52 subjects (29 female; age 20-33) took part in two fMRI sessions: encoding and retrieval, with stimuli selected from the Nencki Affective Word List (NAWL). During encoding session, they were presented with word pairs (disgusting/fearful/neutral), and instructed to imagine them unitized. After 2-3 weeks, during the recognition session, they were presented with old pairs from encoding and new lures, and asked to determine if a word pair was old or new. Behavioral analyses showed the main effect of emotion. Specifically, emotional stimuli were better remembered than neutral, and disgusting better than fearful. At the neuronal level, correct compared to incorrect recognition of word pairs was related to a higher index of encoding-retrieval similarity of brain activation patterns in the left middle temporal gyrus. The activation of left amygdala during encoding significantly modulated brain activation during recognition in the right hippocampus and right inferior frontal gyrus. Finally, we found that the level of encoding-retrieval similarity was correlated with left amygdala activation during encoding of disgusting compared to fearful word pairs. These results suggest that the influence of verbal associations eliciting various basic emotions on the memory processes cannot be simply put down to differences in affective dimensions. These results also indicate that disgusting words are distinctive for human memory and trigger effects dependent on different brain mechanisms than fear.

Session

Social decision making

Time: **Saturday, 21/Jul/2018: 4:10pm - 5:50pm**

Location: **CZ-5**

Session Chair: **Michiel Marten Spape**

4:10pm - 4:30pm

The semiotics of the message and the messenger: Non-verbal information determines fairness perception in the Ultimatum Game

M. M. Spape[1], V. Harjunen[4], I. Ahmed[2], G. Jacucci[2], N. Ravaja[3]

[1]Department of Psychology, Liverpool Hope University, United Kingdom; [2]University of Helsinki, Department of Computer Science; [3]University of Helsinki, Department of Social Research; [4]Aalto University, School of Business

Nonverbal communication determines much of how we perceive explicit, verbal messages. Facial expressions and social touch, for example, influence affinity towards people and conformity to their requests. To understand the interaction between non-verbal and verbal information, we studied how the psychophysiological time-course of making sense of a message – the semiotics – is altered by facial expressions and touch. A VR based economic decision-making game of Ultimatum was designed in which participants responded to financial offers of variable levels of fairness. In line with previous studies, unfair offers evoked medial frontal negativity (MFN) within the N2 time window, which has been interpreted as reflecting an emotional reaction to violated social norms. Contrary to this emotional interpretation of the MFN, however, nonverbal signals did not modulate the early N2 component, only affecting fairness perception during the P3 intervals. This suggests that the non-verbal context affects the late, but not the early stage, of perceiving a message. We discuss the implications of non-verbal effects on understanding messages as a process by which parallel information sources of "*who* says *what*" are integrated in reverse order: The semiotics of the message, then the messenger.

4:30pm - 4:50pm

Decoding proposers' motivations in the ultimatum game

S. P. H. Speer, M. A. S. Boksem

Marketing, Rotterdam School of Management, Netherlands, The

In the Ultimatum Game (UG), the proposer may have different motivations for splitting their endowment evenly. They may do so out of fairness concerns or because they want to avoid rejection of the offer on the responders' side. Here, we used fMRI to identify neural patterns that discriminate between these two motivations. Participants played twelve rounds of the UG and Dictator Game (DG), as proposers. We used support vector classifiers trained on whole brain activation patterns to classify which game the participants were playing. As responders cannot reject the offer in the DG, the neural mechanisms underlying decision-making between these two games should differ for fairness driven versus strategic decision makers. Further, a representational similarity analysis (RSA) searchlight procedure was used to investigate where in the brain the neural similarity between games correlated with individual differences in offer size between games. Results indicated that we were able to accurately discriminate between neural patterns associated with UG and DG trials. More importantly, we found that the classification accuracy for the participants correlated strongly with their average difference in offer size between UG and DG. For the RSA searchlight, we found that dissimilarity between neural patterns associated with the two games correlated significantly with individual differences in offer size between games in the amygdala, posterior cingulate cortex (PCC) and the middle frontal gyrus (MFG). Our results suggest that, in contrast to fairness-driven individuals, strategic individuals do not perceive the UG as a social interaction, but rather as a risky-investment situation.

4:50pm - 5:10pm

Clear moral judgments based on unclear evidence: Person evaluation is strongly influenced by untrustworthy gossip

J. Baum[1,2], M. Rabovsky[1,3], S. Rose[1], R. Abdel Rahman[1,2]
[1]Humboldt-Universität zu Berlin, Germany; [2]Berlin School of Mind and Brain, Humboldt-Universität zu Berlin, Germany; [3]Freie Universität Berlin, Germany

Affective information about other people's social behavior may prejudice social interactions and bias moral judgments. The trustworthiness of person-related information, however, can vary considerably, as in the case of gossip, rumours, lies, or so-called "fake news". Here, we investigated how spontaneous person-likeability and explicit moral judgments are influenced by trustworthiness, employing event-related potentials as indexes of emotional brain responses. Social-emotional information about previously unknown persons was verbally presented as trustworthy fact, (e.g. "*He raped a woman*") or marked as untrustworthy gossip (by adding e.g. *allegedly*). In Experiment 1, spontaneous likeability, deliberate moral judgments and electrophysiological measures of emotional person evaluation were strongly influenced by negative information, yet remarkably unaffected by the trustworthiness of the information. Experiment 2 replicated these findings and extended them to positive information. Our findings demonstrate a tendency for strong emotional evaluations and moral judgments even when they are knowingly based on unclear evidence.

5:10pm - 5:30pm

Two shades of leader's trustworthiness: Electors from opposite sides of the political spectrum differ in the dispositional and situational trust toward a political leader

B. Gjoneska[1,2], G. Porciello[1,2], M. T. Liuzza[1,2,3], G. V. Caprara[1]
[1]Department of Psychology, "Sapienza" University of Rome, RM 00185; [2]IRCCS Santa Lucia Foundation, Rome, RM 00142; [3]Department of Surgical and Medical Sciences, "Magna Graecia" University of Catanzaro, Catanzaro, CZ 88100

We investigated dispositional and situational trust toward Silvio Berlusconi (SB), a conservative leader and former Italian Prime Minister, as compared to Piero Angela (PA) a famous Italian showman, in 168 left/right oriented Italians (LW/RW = 89/79). Dispositional and situational trust were collected via trustworthiness ratings (TR) and economic exchanges in an iterated version of the trust game (TG) where the Trustee (SB/PA) reciprocated or not participants' offers. Participants' perceived similarity (PS) and implicit attitudes (single-category implicit association test, SC-IAT) towards SB or PA were also measured. Separate ANOVAs with the Group (LW/RW) and the Personage (SB/PA) as independent variables while PS, SC-IAT and TR as dependent variables reveal that the two groups do not differ in their perception of Angela, but they differ regarding Berlusconi (with the RW-group scoring higher on all dependent variables). Interestingly, while the RW-group attribute higher scores of TR towards Angela than Berlusconi (probably due to the political scandals related to him), at the implicit level (PS and SC-IAT) the two do not differ. A mediational analysis reveals that the relationship between partisanship and dispositional trust in RW-group towards Berlusconi is mediated by implicit measures. In addition, mixed-models analysis performed on participants' TG offers show that while LW-group adjust according to the economic behavior of the Trustee (increasing/decreasing offers over time), RW-group don't when they play with SB. In summary, it seems that in RW-group, implicit attitudes mediate dispositional trust towards their leader and disposition for authoritarian submission (instead of leader's behavior) shapes their situational trust.

5:30pm - 5:50pm

The role of ventromedial prefrontal cortex and temporo-parietal junction in third-party punishment behavior: A tDCS study

E. Lo Gerfo[1], A. Gallucci[2], R. Morese[3,4], S. Ottone[1], A. Vergallito[2], G. Locatelli[2], F. Bosco[3], F. Ponzano[5], R. L. Leonor Josefina[2]
[1]Department of Economics, Management and Statistics, University of Milano Bicocca, Italy; [2]Department of Psychologia, University of Milano Bicocca, Italy; [3]Department of Psychology, Center for Cognitive Science, University of Turin, Turin, Italy,; [4]Faculty of Communication Sciences, Università della Svizzera Italiana, Lugano, Switzerland; [5]University of Eastern Piedmont, Department of Political Science, Italy

Third-party decision-makers punishes , sacrificing selfish interests, offenders who violate either fairness or cooperation norms to maximize their self-interest. The degree of punishment increases with the severity of norm violation. This choice to punish is defined as altruistic punishment. An opposite and apparently paradoxical behavior, namely anti-social punishment, is instead the tendency to spend own money to punish cooperative or fair allocation. Previous fMRI studies correlated punishment behavior with the recruitment of reward system areas (e.g. VMPFC) and with increased activation of the mentalizing network (e.g. TPJ) and central-executive network. In the present study we aimed at investigating the role of VMPFC and TPJ in punishment behaviors through the application of anodal transcranial direct current stimulation (tDCS). 60 healthy participants were randomly assigned to three tDCS conditions: two real anodal conditions over VMPFC or TPJ, and a sham/placebo stimulation. At the end of the stimulation participants played a third-party punishment game, consisting in viewing a series of fair or unfair monetary allocations between unknown proposers and recipients. Participants were asked to determine whether and how much to punish the proposer using their own monetary endowment. Results show that anodal tDCS over VMPFC increases altruistic punishment behavior whereas anodal tDCS over TPJ increases anti-social punishment choices compared to sham condition. These results support the idea that the two types of punishment behaviors rely upon different brain regions, suggesting that different brain networks, reward and mentalizing systems underlie altruistic and anti-social punishment behaviors.

Session

SYMPOSIUM - In memory of John T. Cacioppo

Time: *Location:* **CZ-1**

Sunday, 22/Jul/2018:
9:00am - 10:40am

Organizer(s): **Arvid Kappas & Claus Lamm**

John T. Cacioppo was one of the pioneers and founding figures of the field of Social Neuroscience. He not only originally coined the term in the early nineties, but also made continuing seminal contributions to the field, on many levels. Following his untimely passing on March 5 2018, this symposium will highlight research inspired by his work, as well as commemorate him as an outstanding role model for the future generations of young scientists attending the ESCAN meeting. The tentative program of the symposium will included the following speakers, and topics: David Amodio, from University of Amsterdam, will speak about the role John's work had in bridging Neuroscience and Social Psychology. Carien van Reekum, from Reading University, will highlight John's foundational work in using psychophysiological measures to study the biological based of emotion and cognition. Eric Vanman from University of Queensland will speak about the role of muscle activity in neuroscience, reflecting John's interests in the EMG signal in his early work. Claus Lamm, from University of Vienna, will focus on the bio-psychological implications of loneliness, a research topic to which John has made foundational contributions in the last decade. Finally, Arvid Kappas from Jacobs University will showcase how John's thoughts on cross-disciplinary and multi-level integration of research approaches have had a profound influence on the structure of psychology and cognitive science programs at universities worldwide, and how this will shape the training of future generations of scientists in the domains of Social, Cognitive and Affective Neuroscience and Psychology.

9:00am - 9:20am

Reimagining the science of the human condition: On John Cacioppo's vision for social neuroscience

D. M. Amodio
Psychology, University of Amsterdam, New York University, United States of America

As a PhD student in social psychology in the mid 1970s, John Cacioppo realized that to truly understand the human social psychology and behavior, one must consider the complex interplay of social, cognitive, and biological processes. This approach was unheard of in social psychology, and despite pushback from all sides, John sought integrative training and began to publish the first programmatic social psychophysiology research. Within a few years, he had developed a new scientific paradigm, received newfound support and recognition, and set to training future generations of social neuroscientists. Today, the field thrives, thanks to John's vision, generosity, mentorship, and advocacy. In this talk, I will describe John's singular role in creating the social neuroscience approach and its relation to the field as we know it today.

9:20am - 9:40am

Affective space and emotion specificity in psychophysiology: John Cacioppo's legacy in emotion science

C. M van Reekum
School of Psychology and Clinical Language Sciences, University of Reading, United Kingdom

Whilst positive and negative valence are commonly conceptualised and measured as end points of a dimension, John Cacioppo and collaborators proposed that positive and negative evaluative processes could, and possibly often do, act independently. This segregation would also be reflected in appetitive (approach) and aversive (avoidance) responding of the organism. In this talk, I will review some of John's major contributions to the field of emotion science, and give a few examples of how John's notions have guided my psychophysiological research and that of many others

9:40am - 10:00am

Whatever happened to the somatic nervous system? Revisiting John Cacioppo's early work on facial electromyography

E. J. Vanman
University of Queensland, Australia

All behavior is a product of the coordinated contractions of some of the several hundred muscles in the human body. Talking, smiling, kissing, pressing computer keys, aggressing, discriminating, purchasing, voting, gesturing, leading – these are among the many actions studied by cognitive and behavioral scientists, and each is ultimately mediated by the somatic nervous system. Duchenne (1862), Spencer (1870), Darwin (1872), and James (1890) all were interested in the relatively subtle patterns of somatic actions to understand human behavior generally. John Cacioppo's initial forays into psychophysiology and social neuroscience mainly relied on facial electromyography (EMG) as a tool to investigate social, emotional, and clinical research questions. Facial EMG offers a less time-consuming method to quantify the activity of facial muscles, compared with methods involving systematic coding of facial expressions, and it is a relatively unobtrusive measure. Affective and cognitive responses can be continuously monitored throughout the testing session. Moreover, participants are often unaware of their responses or are possibly unwilling to report those of which they are aware. In this presentation I will review some of the key EMG studies by Cacioppo and his colleagues in the 1980s. These included papers on persuasion, basic affective responses, cognitive processing of messages, and unconscious affective reactions during a clinical interview. While reflecting on John Cacioppo's contributions, I will argue that it is time for social, cognitive, and affective neuroscience to reconsider the role of muscle activity.

10:00am - 10:20am

The psychophysiology of empathy, emotion contagion, and loneliness

C. Lamm
SCAN-Unit, University of Vienna, Austria

John Cacioppo has made seminal and pioneering contributions towards our understanding of mimicry and emotion contagion, precursors of empathy and the ability to share and understand others. In my talk, I will highlight some of these contributions, and connect them to more recent research highlighting the interplay between reflex-like bottom-up and bodily and emotional resonance phenomena with top-down cognitive and reflective processes. I will also attempt to connect these findings to one of John Cacioppo's major research themes in the last years of his career, the investigation of loneliness and its physiological and psychological correlates and consequences.

10:20am - 10:40am

Complexity and beauty: The doctrine of multilevel analysis

A. Kappas

Psychology and Methods, Jacobs University Bremen, Germany

John Cacioppo is known for being one of the founders of social neuroscience. However, in his case, social neuroscience is more than a logical improvement on the previously existing concept of social psychophysiology, but rather the logical consequence of his views regarding the necessity of multilevel analysis. This is a highly interdisciplinary concept that is targeted at understanding biological systems and how they implement cognition, social processes, and behavior. It provides a fresh approach to two classical themes, nature vs nurture and body vs soul that have complicated our understanding of humans. At the same time it impacts how to develop research questions and paradigms, as well as, at a different level, how research might be organized in departments, or in funding policy. I will briefly outline the concept of multilevel analysis as presented by Cacioppo and his colleagues and give examples from different contexts.

Session

SYMPOSIUM - You only know when it's gone: neural (network) and behavioral effects of amygdalar lesions

Time: *Location:* **CZ-2**

Sunday, 22/Jul/2018:
9:00am - 10:40am

Organizer(s):**Jan Van den Stock**

The amygdala is considered a key region in the emotional brain, if not the primary emotional brain structure. Against the background of results from animal studies, functional brain imaging studies in healthy controls, patients with a neurologic, neurosurgical and neuropsychiatric history, a current dominant view posits that the amygdala is involved in accurate recognition of emotions, particularly 'fear' and that the associated neural mechanism operates through network modulation by the amygdala of emotional responses in distant brain areas, e.g. the fusiform face area. The bulk of these studies have focused on facial expressions. The symposium addresses a fine-tuning of the role of the amygdala in emotion recognition and its role in the emotional brain network. These questions are tackled by focusing on three patient populations that show amygdalar damage through different etiology: 1) Urbach-Wiethe disease; 2) behavioral variant fronto-temporal dementia and; 3) neurosurgical resection of the anterior temporal lobe. The talks will extend on what has been reported for facial expressions and include behavioral and neural processing of vocal and bodily emotion cues. Furthermore, the talks will focus on changes in emotional brain networks in patients with damage to the amygdala.

9:00am - 9:20am

Amygdala and threat-related action: Evidence from Urbach-Wiethe disease

D. R Bach[1,2]

[1]Department of Psychiatry, Psychotherapy, and Psychosomatics, University of Zurich, Switzerland; [2]Wellcome Trust Centre for Human Neuroimaging, University College London

Acute threat often requires rapid action-selection and decision-making. Neural implementation of this function remains controversial. Conceptualisations range from highly specific pre-programmed systems, each catering for particular threat scenarios, to general-purpose or modular systems that are active across a wide range of threats. Based on its role in fear conditioning and on neuroimaging evidence from humans, the amygdala has been suggested to globally serve detection of threat or salient situations in the environment, and and prioritisation of resources towards action. Here, we address this question in two twin patients with Urbach-Wiethe syndrome and sub-total but rather specific amygdala calcifications. In a face-in-the-crowd task, the anger superiority effect - i.e. detecting angry faces faster than happy faces - is inverted in these patients. In an approach-avoidance conflict computer game, thought to model anxiety behaviour, behavioural patterns match those of hippocampal sclerosis patients, and show features similar to those of lorazepam-treated healthy controls. At the same time, patients show unimpaired attentional capture in an attentional blink task with threat-related words. They are also unimpaired in detecting fearful and anger prosody, important social signals for threat in the environment (fearful) or direct conspecific threat (anger). To summarise, our results do not speak in favour of a global threat prioritisation function of the human amygdala. Instead, they suggest a range of more specific functions in threat-related behaviour, in line with suggestions of multiple action-selection systems under threat.

9:20am - 9:40am

Behavioral and neural processing of emotional expressions in frontotemporal dementia

L. Van de Vliet[1], F.-L. De Winter[1,2], M. Vandenbulcke[1,2], J. Van den Stock[1,2]

[1]Laboratory for Translational Neuropsychiatry, Division of Psychiatry, Department of Neurosciences, KU Leuven; [2]Department of Old Age Psychiatry, University Hospitals Leuven

Recognition of emotional facial expressions is an important part of our social communication skills. The Superior Temporal Sulcus (STS) in humans consists of functional sub divisions with a face-selective area in the right posterior STS (rpSTS) that responds both to human and non-human expressions and a more anterior area in the right middle STS (rmSTS) that responds specifically to human emotions (Zhu, Nelissen et al. 2013). This indicates that the human STS may have unique properties to deal with social cues and facial expressions in particular. To further investigate the functionality of these two separate face-selective regions and their connections to the broader emotional brain network we performed both structural and functional imaging analysis targeting emotional facial recognition in a group of –bvFTD patients. Critically, these patients display bilateral atrophy of the amygdala. They underwent a series of emotion recognition tasks in and outside the MRI-scanner as well as resting-state fMRI. Here we report the results of the functional connectivity analyses with seeds in amygdala and STS and how these results relate to emotion processing.

9:40am - 10:00am

Effects of amygdala lesions on the neural processing of affective voices

S. Frühholz

Cognitive and Affective Neuroscience, Institute for Psychology, University of Zurich

Affective voices receive enhanced decoding in the auditory system. This enhanced cortical decoding is assumed to be remotely driven by the amygdala, which generally responds to emotionally meaningful stimuli. This remote influence of the amygdala on auditory cortical processing of affective voices can be tested in patients with lesions in the amygdala. We therefore tested how selective damage to the left or right amygdala impairs the cortical processing of human (affective) voices. Patients with unilateral amygdala resection either listened to neutral voices and to nonvocal sounds (experiment 1) or heard binaural vocalizations with attention directed towards or away from affective voice information (experiment 2). In experiment 1, all patients showed reduced activation to voices compared to nonvocal sounds in the ipsilesional auditory cortex using fMRI. In experiment 2, affective voices evoked increased activity in both the auditory cortex and the intact amygdala for right-damaged patients, whereas no such effects were found for left-damaged amygdala patients. Furthermore, the left inferior frontal cortex was functionally connected with the intact amygdala in right-damaged patients, but only with homologous right frontal areas and not with the amygdala in left-damaged patients. Unilateral amygdala damage thus leads to globally reduced ipsilesional cortical voice processing independent of the laterality of the lesion, but only left amygdala lesions are sufficient to suppress the enhanced auditory cortical processing of affective voices. Patients with left amygdala lesions also showed an altered functional network largely involving frontal brain regions that might compensate their neural deficits in affective voice processing.

10:00am - 10:20am

Investigation of emotion circuits in the brain of healthy volunteers and patients with anterior temporal lobectomy

Y.-A. Huang

Department of Neuroscience, KU Leuven, Belgium

Understanding emotional expressions from others is an important social skill in our daily life. Recently, an accumulating number of studies report that emotional processing involves the integration of several networks that are associated with fundamental psychological processes, including the core affect network, conceptualization network, language and executive control network. These results support the so called psychological construction theory. From this viewpoint, emotions emerge from the interaction between different fundamental psychological functions. Based on this, we recently provided evidence for a general emotion perception pathway in addition to distributed pathways to process specific emotions. In the talk, I will communicate the results of our studies addressing how lesions in the anterior temporal lobe affect the connection patterns of these emotion processing networks using the innovative technique of general psychophysiological interaction (gPPI) combined with graph theory with graphical measures. The former examined the directed functional connectivity between each of two brain regions, while the graphical measures represented the connection properties of the network.

10:20am - 10:40am

Amygdalae-motor connectivity and adaptive action

B. de Gelder

Maastricht University, Netherlands, The

My presentation will address the role of the amygdalae in perception of threat signals, more specifically those provided by aggressive body language. In line with our view that emotional experience is closely related to how the body reacts to we will specifically focus on the relation between amygdalae and adaptive action processes. We will review recent findings from populations with amygdala damage, from Ecog recordings and from neurotypical participants exposed to increasing levels of threat in virtual reality fMRI studies.

Session

Empathy

Time: **Sunday, 22/Jul/2018: 9:00am - 10:40am**

Location: **CZ-3**

Session Chair: **Andrew Kenneth Martin**

9:00am - 9:20am

Electrophysiological correlates of affective empathy in forensic patients with psychopathic traits

J. D. M. van Dongen[1], I. A. Brazil[2], I. H. A. Franken[1]

[1]Department of Psychology Education and Child Studies, Erasmus University Rotterdam, Netherlands, The; [2]Radboud University, Donders Institute for Brain, Cognition and Behaviour, Nijmegen, The Netherlands

Violent behavior in forensic patients may be explained by psychopathic traits, including a lack of empathy for other persons. Recent studies, generally in non-clinical populations, have demonstrated that empathy for pain recruits brain areas involved in affective and motivational processing. However, less is known about the electrophysiological correlates of dysfunctional empathy in violent forensic patients when viewing victims of aggression. In the current study, we extended previous findings by comparing electrophysiological responding to victims of aggressive scenes in forensic male patients (N = 24) with the responding in 'healthy' male controls from the community (N = 29). Results showed that forensic patients scored higher on psychopathy (SRP-SF), especially the antisocial and lifestyle traits (Factor 2). Moreover, forensic patients show reduced LPP amplitudes compared with healthy controls in response to pictures of victims of aggression ($r = -.54$, $p < .001$). To quantify this outcome, Bayesian statistics were used. The Bayes factor (BF10) is the probability of the data under the alternative hypothesis relative to the probability of the data under the null hypothesis. BF10 was 715.78 for the patient sample, indicating extreme evidence for the likelihood of this outcome. The current findings add to a understanding of the electrophysiological underpinnings of affective empathy in violent forensic patients. Thereby, it contributes to the development of new neurophysiological based interventions for psychopathic personality.

9:20am - 9:40am

Promoting empathy with rhymes: Effects of poetry exposure on physiological arousal and empathic trait

G. Gabrieli[1], A. Truzzi[1], P. Rigo[2,3], L. Onnis[4], G. Esposito[1,3]

[1]Department of Psychology and Cognitive Science, University of Trento, Italy; [2]Psychology Program, School of Social Sciences, Nanyang Technological University, Singapore; [3]Department of Developmental Psychology and Socialization, University of Padova, Italy; [4]Division of Linguistics and Multilingual Studies, School of Social Sciences, Nanyang Technological University, Singapore

Empathic abilities can be promoted by reading literary fiction, since understanding fictional narrative requires

more authors' intentions interpretation than journalistic or academic writing. Here, we aimed to investigate whether reading a poem, which involves higher levels of inference than prose, further increases trait empathy levels. In Study 1, 70 adults (Italy=30, Singapore=40) read either a poem or a non-poem over the same topic (family bonding). Trait empathy levels were measured before and after text presentation through self-reported questionnaires, while ECG recordings were taken during text presentation. To rule out attention modulation, in Study 2 EEG measurements were recorded from 45 participants (Italy=16, Singapore=24) who read both the poem and the non-poem. In each study, participants' literary knowledge was assessed using the Authors' Recognition Test. Results from Study 1 indicate that the poem increases empathy trait levels, especially in individuals with a lower empathic baseline, and physiological arousal, as highlighted by increased low frequencies and decreased variability in participants' heart rate, compared to the non-poem condition. Study 2 revealed that poem's reading effect was not due to attentional modulation since no difference in frontal areas' gamma waves was found. Rather, poem reading enhanced participants' relaxation as highlighted by an increase in alpha wave activities. Comparable results were obtained in both Western and Eastern populations, lending support to effects generalizability. Findings suggest that reading poetry increase empathic traits modulating readers' neurophysiological activity. As such, poetry exposure could help individuals increase their empathic behaviors.

9:40am - 10:00am

Connectivity architecture underlying brain activation for theory of mind: Converging or separable networks?

M. Schurz[1], M. Tholen[2], J. Perner[2], J. Sallet[1], R. Mars[1]

[1]Department of Experimental Psychology, University of Oxford, United Kingdom; [2]Centre for Cognitive Neuroscience, University of Salzburg, Austria

This talk/poster presents meta-analytic and empirical evidence from functional brain imaging on the separation of functional processes for understanding other's (theory of mind) in the lateral posterior parietal cortex. We carried out quantitative neuroimaging meta-analyses (Schurz et al., 2014; in preparation) and a probabilistic labeling review (Schurz et al., 2017) of reported brain activation around the temporo-parietal cortex for theory of mind tasks. These works suggest that, in this region, brain activation for theory of mind and affect sharing is shaped by underlying structural brain connectivity networks, which converge around parietal association cortex. To follow up our hypothesis, we carried out a new fMRI study, scanning BOLD activity for a number of theory of mind tasks, as well as brain connectivity from diffusion MRI and resting-state fMRI. The temporo-parietal area was parcellated according to whole-brain connectivity fingerprints, and relationships to functional brain activity were analyzed. Findings are relevant for understanding to what extent activations for different theory of mind tasks in the temporo-parietal cortex reflect operations of a single, common brain network (i.e. fall within one parcellated area), and if they are rather shaped by conjoint operation of multiple networks (i.e. fall within multiple parcellation areas / a border area between parcellations). This in turn, is helpful for understanding what the possible common process is that's engaged by different theory of mind tasks, i.e. the process underlying activation in a so-called theory of mind "core-area" (Schurz et al., 2014).

10:00am - 10:20am

Improving cross-cultural "mind-reading" using electrical stimulation

A. K. Martin, P. Su, M. Meinzer

Centre for Clinical Research, The University of Queensland, Australia

A cross-cultural disadvantage exists when inferring the mental state of others. In an ever increasingly globalised world, removing cross-cultural disadvantage on ToM tasks is important. The dorsomedial prefrontal cortex (dmPFC) is a key node of the social brain that is engaged during "mind-reading" during adolescence, but this association diminishes in adulthood. This suggests a role in the learning or maturation phase of theory of mind (ToM). Therefore, recruitment of the dmPFC may improve cross-cultural mind-reading, especially for those with reduced cross-cultural contact. 52 (26 F/M) Singaporeans and 52 (26 F/M) Caucasian Australians performed the Caucasian version of the Reading the Mind in the Eyes Test and received HD-tDCS to either the dmPFC or the right temporoparietal junction (rTPJ) in sham-controlled, double blinded, crossover studies. Contact with Caucasians was ascertained for the Singaporean cohort as a potential mediator of ToM performance and subsequent HD-tDCS response. In the Singaporean cohort, a significant positive correlation was identified between ToM performance and contact with Caucasians. The effect of HD-tDCS to the dmPFC correlated with contact with Caucasians, such that anodal HD-tDCS improved performance to a greater extent in those with less contact. No effect was identified for the rTPJ group showing site specificity. No effects were demonstrated for the lower-order age and gender judgements, displaying task specificity. Cross-cultural disadvantage on ToM disappears with increased contact. Brain stimulation can increase our understanding of the associated neural processes and potentially improve the rate of cross-cultural ToM inference from facial cues.

10:20am - 10:40am

Extra presentation

Mindfulness can mediate stress: as told by physiological markers

M. C. Pascoe

The Institute for Health and Sport (IHES), Victoria University, Australia

Stress is common and leads to the development of anxiety. Meditation is a popular form of stress and anxiety management, argued to mediate stress reactivity. However, many studies in this field commonly fail to include an active control group. Given the frequency with which people are selecting meditation as a form of self-management, it is important to validate if the practice is effective in meditating stress-reactivity using well-controlled studies. Thus, we aimed to conduct a meta-analysis investigating the neurobiological effects of meditation, including focused attention, open monitoring and automatic self-transcending subtypes, compared to an active control, on markers of stress. In the current meta-analysis and systematic review, we included randomised controlled trials comparing meditation interventions compared to an active control on physiological markers of stress. Studied outcomes include cortisol, blood pressure, heart-rate, lipids and peripheral cytokine expression. Forty-five studies were included. All meditation subtypes reduced systolic blood pressure. Focused attention meditations also reduced cortisol and open monitoring meditations also reduced heart rate. Overall, meditation practice leads to decreased physiological markers of stress in a range of populations

Session

Perception and emotion

Time: *Location:* **CZ-4**
Sunday, 22/Jul/2018:
9:00am - 10:40am

Session Chair: **David Terburg**

9:00am - 9:20am

Emotional cues from faces modulate interoceptive cardiac processing

A. C. Marshall, A. Gentsch, S. Schütz-Bosbach
General and Experimental Psychology, Ludwig-Maximilians University, Germany

Interoception refers to the processing of homeostatic bodily signals. Recent work demonstrates that interoceptive markers can be modulated by exteroceptive stimuli and suggests two potential mechanisms for this phenomenon in the form of attentional weighting or cognitive self-enhancement. Here, we tested both accounts by exploring the impact of emotional valence on interoceptive processing. Across two experiments, participants completed a repetition-suppression paradigm in which faces wearing different emotional expressions were repeated or alternated. Multichannel EEG was recorded to explore the amplitude of the Heartbeat Evoked Potential (HEP) as a marker of interoceptive cardiac processing. In experiment 1, faces wore either angry or pained expressions to induce adverse states of different attentional significance. In experiment 2, expressions were happy or sad to test for preferential processing of positive and a distancing response to negative states. Results of experiment 1 revealed a significant elevation of HEP amplitude to repeated painful expressions while repeated angry faces led to HEP suppression. Results of experiment 2 revealed HEP elevation to repeated sad faces while no effects manifested for happy expressions. This pattern of results suggests that attention is directed inwards (higher HEP amplitude) for adverse internal states, while internal focus decreases for adverse states directed at the external environment. Findings hereby highlight an effect of emotional valence on interoception and support an attentional weighting account of this phenomenon.

9:20am - 9:40am

Effects of emotional arousal on ambiguous motion perception

N. Turkileri, A. Ozsari, D. T. Field, M. Sakaki
University of Reading, University of Reading, United Kingdom

Previous research documented that emotional stimuli are preferentially perceived relative to non-emotional stimuli. However, less is known about how arousal induced by emotional events influences perception of other stimuli nearby in time or space. Recent research shows that arousal sometimes enhances perception of subsequent visual stimuli but sometimes impairs perception of visual stimuli (Lee et al., 2014; Phelps et al., 2006). The Arousal Biased Competition (ABC) theory (Mather & Sutherland, 2011) suggests that emotional arousal enhances processing of salient stimuli but impairs low-salient stimuli. In this study, we tested the prediction of the ABC theory by examining the effects of emotional arousal on ambiguous motion perception. We used two drifting Gabor patches that moved in opposite directions (one drifted to the left and the other drifted to the right) and superimposed one over the other (VanRullen et al., 2005). To examine the effects of saliency, we also manipulated their contrast levels; in some trials, the two Gabor patches had a clear difference in their contrast levels (90% vs. 10%; low ambiguous condition), whereas on other trials, the difference in the contrast levels was smaller (56% vs. 44%; ambiguous condition). Before each trial, arousal was manipulated by a sound clip. Results showed that hearing an arousing sound enhanced the perception of the high contrast patch in the ambiguous condition. These results are consistent with the ABC theory, suggesting that emotional arousal induces a reduction on ambiguity in favour of high salient stimuli.

9:40am - 10:00am

Empowering feedback connections in temporo-occipital network boosts visual perception of emotions

S. Borgomaneri[1,2], A. Avenanti[1,2]
[1]Dipartimento di Psicologia, Università di Bologna and Centro studi e ricerche in Neuroscienze Cognitive, Campus di Cesena, Università di Bologna; [2]IRCCS Fondazione Santa Lucia, 00179 Rome, Italy.

Accurately recognizing emotional expressions is critical for social life. Perceiving others' emotional expressions activates a complex visual network including the primary visual cortex (V1) and higher-order regions such as the superior temporal sulcus (STS) which is known to encode biological motion. Yet, a fundamental and unanswered question is how STS and V1 interact to give rise to accurate emotion recognition. Using transcranial magnetic stimulation, we administered a novel cortico-cortical paired associative stimulation (ccPAS) protocol to transiently enhance synaptic efficiency in STS-to-V1 reentrant connections and demonstrate their plasticity and functional relevance to emotion perception. In EXP1, STS-to-V1 ccPAS was used to strengthening reentrant connections from STS to V1 with an optimal IPI (interpulse interval) of 200 ms. In EXP2, a V1-to-STS ccPAS protocol with the same IPI was performed, thus controlling for the directionality of the connectivity. In EXP3, a STS-V1 simultaneous ccPAS (IPI: 0 ms) was administered, thus controlling for timing. In EXP4, a sham ccPAS protocol was performed, controlling for non specific TMS effects. In all the experiments, participants were tested in an emotion discrimination task before and after ccPAS. We found that the STS-to-V1 ccPAS protocol aimed at increasing synaptic efficiency in the STS-to-V1 reentrant connections increased the ability to discriminate emotional expressions. No perceptual enhancement was observed following control ccPAS protocols. We provide novel causal evidence that STS-to-V1 back-projections, are malleable and functionally relevant to emotion recognition. These findings have implications for theoretical models of visual perception and awareness and for the rehabilitation of visual deficits.

10:00am - 10:20am

Finding easy prey: Effects of testosterone on self-relevant threat detection

D. Terburg
Experimental Psychology, Utrecht University, Netherlands, The

Individuals with emotional expression tend to stand-out among a crowd: Their expressions draw attention and are therefore easily detected. However, the individual's gaze may both facilitate and interfere with this effect, depending on the expression. Specifically, fearful expressions are more easily recognized when gaze is averted, while the opposite holds for angry faces. Indeed, in terms of threat detection it seems most self-relevant to detect those individuals that are angry with you, as well as those individuals that are fearful of something in the

environment, as both indicate a direct threat. We investigated this interplay of 'gaze' and 'face' in threat detection by using 'average' face stimuli that are strictly controlled for basic image characteristics in an eye-tracked visual search paradigm. In a first experiment we show increased search efficiency for self-relevant threatening faces (fearful/averted-gaze and angry/direct-gaze). In a second experiment we replicate these effects and use eye-movement data to show that the self-relevance effect for fearful faces is particularly due to faster detection, rather than identification, of the target. In a third, placebo-controlled testosterone-administration, experiment we show that testosterone abolishes this effect completely, particularly by boosting the rapid detection of fearful faces with direct gaze. Together these findings show that humans are highly efficient in finding self-relevant threat among a crowd of faces, and furthermore suggest that testosterone motivates to find the fearful, easy prey, within a crowd.

10:20am - 10:40am

Prioritized neural coding of emotion cues during perceptual decision-making

E. Meaux[1], M. El Zein[2], R. Mennella[1], V. Wyart[1], J. Grèzes[1]

[1]Département d'étude Cognitive, LNC[2], Ecole Normale Supérieure de Paris, France; [2]Institute of Cognitive Neurosciences, UCL, UK

Animals including humans are very good at detecting and categorizing emotions in conspecifics, even based on ambiguous perceptual cues. It remains unclear whether the processing of emotion cues through decision making engages specific neural substrates or whether it relies on the same mechanisms used to process other, non-social, cues. To address this question, we designed a perceptual detection task in which we manipulated orthogonally the relevance and ambiguity of emotion vs. non-social cues. We presented morphed facial displays of emotion (from neutral to anger) on top of a colored background (from grey to violet). Participants were asked to report the presence or absence of either emotion (anger) or color (violet) in the stimulus, while ignoring the other task-irrelevant dimension. Importantly, we equalized detection sensitivity across dimensions using an adaptive titration procedure. Quantitative psychometric modeling of behavior and electrical brain activity revealed that emotion cues benefit from a prioritized neural coding. First, the neural coding of perceptual evidence arises earlier, around 150ms, when the decision concerns emotion rather than color in attention-selective regions. Second, we demonstrate a specific early coding of emotion strength between 160-360ms after stimulus onset in the mu frequency band in motor cortices, reflecting stronger motor preparation for decisions about emotions. Third, the neural coding of emotion cues at these early latencies in both attentional and motor areas varies as a function of individuals' social anxiety. Together, these findings indicate a selective, prioritized neural representation of socially-relevant perceptual cues during perceptual decision-making.

Session

SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach

Time: **Sunday, 22/Jul/2018: 9:00am - 10:40am**

Location: **CZ-5**

Organizer(s): **Giorgia Silani**

Social motivation and social rewards are fundamental aspects in everyday humans' decisions and behaviours. The understanding of how rewards are processed and motivate behaviour has therefore attract increasing attention and in the past few years has reached unprecedented results, thanks also to the use of multi-disciplinary and multi-level approaches. This symposium aims at bringing together scholars that have contributed to such forefront research on the mechanisms behind social reward processing. The contribution by Antonia Hamilton addresses the question of how we can quantify social motivation, in order to understand individual differences and to track the neural mechanisms which underlie social motivation. Sebastian Korb will present preliminary results on the neurochemical markers of emotion recognition and facial mimicry, investigating how dopaminergic and opiodergic drug challenges modulate responses to social stimuli. Philippe Tobler will expand this findings on the role of dopamine and testosterone in modulating social behaviours such as generosity. Siri Leknes will explain opiod and oxytocin regulation of social reward proceses. Finally Giorgia Silani will present recent findings on the pharmacological dissociation between wanting and linking of social and non-social rewards in humans. By presenting studies that combine multi-methods approaches and perspectives, we aim at giving an up-to-date overview on the biology and biochemistry of social reward and motivation and their implications for clinical research and applications.

9:00am - 9:20am

Measuring social motivation

A. Hamilton[1], A. Georgescu[1], I. Dubey[2]

[1]Institute of Cognitive Neuroscience, University College London, United Kingdom; [2]University of Reading

There is extensive evidence that people are intrinsically motivated to be social – to look at other people, approach them, spend time with them and even maintain a good reputation with them. This talk addresses the question of how we can quantify this 'social motivation', in order to understand individual differences and to track the neural mechanisms which underlie social motivation. We have developed a novel task, called "*chose-a-movie*" or CAM, which provides a simple measure of how much effort participants will exert to view videos from particular categories, for example, smiling people or household objects. First, I will present data from a series of studies showing that social motivation as measured on CAM, relates strongly to autism quotient scores, autism diagnosis and varies with age over a range from 4-20 years. Second, I will present an fMRI study examining the neural mechanisms of social choices, showing evidence that social value is encoded in medial prefrontal cortex. Together, these studies give new insights into the neural and cognitive mechanisms of social motivation and social reward.

9:20am - 9:40am

The neurochemical basis of emotion recognition and facial mimicry

S. Korb[1], C. Massacesi[1], M. Willeit[2], C. Eisenegger[1], G. Silani[1]

[1]Psychology, University of Vienna, Austria; [2]Psychiatry and Psychotherapy, Medical University of Vienna

Facial mimicry, i.e. the imitation of a perceived facial expression, is a well-documented phenomenon. One possible mechanism underlying facial mimicry may be the rewarding nature of social interactions. Especially smiling faces are considered social rewards, and their mimicry may itself be rewarding. Recently, interest has emerged in

the role of the opioid and dopaminergic systems (also underlying the wanting and liking components of reward processing), as well as other neuromodulators, such as testosterone, oxytocin, and vasopressin, on facial mimicry. Empirical evidence however is scarce, and a mechanistic understanding of the neurochemical basis of facial mimicry remains elusive. In an attempt to better understand social reward processing in general, and facial mimicry in particular, I will present preliminary results of a pharmacological study in which participants received, in a placebo-controlled between-subjects design, 50 mg of naltrexone (an opioid antagonist), or 400 mg of amisulpride (a dopamine antagonist). Four hours after drug administration, the perception of changes in facial expression was measured through participants' manual responses, and their facial mimicry of dynamic happy and angry facial expressions was measured with facial EMG of the Corrugator and Zygomaticus muscles. Results will be discussed in light of our recent findings of increased facial mimicry of negative facial expressions after intranasal oxytocin.

9:40am - 10:00am

Pharmacology of male generosity: Role of dopamine and testosterone

P. Tobler[1], A. Soutschek[1], Y. Wu[2]

[1]Department of Economics, University of Zurich, Switzerland; [2]Institute of Advanced Technology, Shenzhen University, China

Generosity characterizes and facilitates human interactions. However, we are not equally generous to others. To close others, we typically are more generous than to distant others, resulting in decreasing generosity as a function of increasing social distance. Relatively little is known about the pharmacological basis of generosity. I will present research showing that, compared to placebo, a selective dopamine D2/D3 blocker increases the generosity of males to relatively close others. By contrast, a single dose of testosterone reduces generosity of males to relatively distant others. Moreover, testosterone seems to mildly affect the perception of social distance, but these effects cannot account for the testosterone effects on generosity. Thus both dopamine and testosterone appear to underpin generosity in males. It is conceivable that the effects of testosterone are mediated by dopamine but this possibility awaits further investigation.

10:00am - 10:20am

Opioid and oxytocin regulation of social reward processes in healthy humans

S. Leknes

Psychology, University of Oslo, Norway

Manipulation of central oxytocin levels via a nasal spray has become a popular, causal method for investigating the neural basis of social behaviours in humans. Complimentary findings on social reward processing in humans is emerging from psychopharmacological research using opioid agonists and antagonist drugs. In my talk, I will compare and contrast methodological considerations and results from these two literatures, drawing on published and new research on oxytocin and opioids from my own lab. For instance, both oxytocin and morphine increase gaze to the eye region of faces, but only oxytocin enhances perception of others' emotional expressions. Morphine, compared to placebo, reduces perception of negative emotions without increasing perception of happiness, perhaps analogous to its pain relieving effects. I will also briefly discuss evidence that these two "social hormones" interact with each other.

10:20am - 10:40am

Wanting and linking of social and non social rewards: The role of dopamine and opioid.

S. Korb[1], C. Massaccesi[1], R. Rumiati[2], C. Eisenegger[3], M. Willeit[4], G. Silani[1]

[1]Department of Applied Psychology: Health, Development, Enhancement and Intervention, University of Vienna, Austria; [2]Scuola Internazionale Superiore di Study Avanzati, Trieste, Italy; [3]epartment of Basic Psychological Research and Research Methods, University of Vienna, Austria; [4]Division of General Psychiatry (Department of Psychiatry and Psychotherapy), Medical University of Vienna, Austria

Human behavior is motivated not only by primary rewards (such as food), but also by social rewards (such as approval). In the last decade, a fundamental challenge has been to understand the different aspects involved in reward. While animal research has clearly established "wanting" and "liking" as two components differing on the neurobiological and neurochemical level, corresponding research in humans is less conclusive. The present study addresses this gap of knowledge by testing whether "wanting" and "liking" can be dissociated in humans on the behavioral and neurochemical level for a) non-social and b) social rewards. By employing novel behavioral paradigms in combination with psychopharmacological manipulations, (e.g. dopamine and opioid antagonists), we aimed at differentially target these two components. In particular, healthy male and female participants were tested in a real effort task, to determine their subjective (ratings of wanting and liking) and objective (squeezing of hand dynamometer) responses to both non-social and social rewards. As a non-social reward, small amounts of milk with different concentrations of cacao were delivered using computer-controlled pumps. As a social reward, participants received forearm caresses at different speeds by a same-sex experimenter. Moreover, in each trial the amount of muscular effort exerted by the participant determined the probability of receiving one of two rewards (e.g. 100% or 25% of cacao). Preliminary subjective and objective data suggest comparable responses of wanting and liking to both food and social rewards (placebo condition) and that these responses are sensitive to pharmacological manipulations (naltrexone or amisulpride).

Session

Social representation

Time: **Sunday, 22/Jul/2018: 11:10am - 12:10pm**

Location: **CZ-1**

Session Chair: **Elien Heleven**

11:10am - 11:30am

Identifying social representation in the brain using repetition suppression and enhancement: A meta-analysis

E. Heleven, F. Van Overwalle

Psychology, Vrije Universiteit Brussel, Belgium

In order to identify the neural substrates of distinct processes and their content, neuroimaging researchers have used repetition suppression, or the reduction of the signal upon repeated presentation of a stimulus, which is indicative of a neural representation or code of the stimulus. Till now, suppression has seldom been used in social neuroscience. We will present a meta-analysis of fMRI studies on social cognition investigating repetition suppression to identify the neural representations of *traits*,

agents and *events* described verbally in sentences, and of goal-directed *movements*, *faces* and *scenes* shown visually in pictures and films. Our goal is to isolates unique neural representations for each of these social concepts. Also an exploratory meta-analysis is performed on a subset of the fMRI studies investigating repetition enhancement, which is the increase in signal upon the repetition of a stimulus.

11:30am - 11:50am

Neural representations of groups and stereotypes using fMRI repetition

J. Delplanque, F. Van Overwalle
Psychology and Educational Sciences, Vrije Universiteit Brussel, Belgium

Our ability to categorize groups and associate them with typical behaviour is an integral part of being human. However, as much as it gave us the ability to distinguish friend from foe, it is also responsible for our tendency to discriminate. In this study we ask where this information on groups and their stereotypical behaviours is stored in the brain. We presented participants with pairs of sentences describing a group member (e.g. the police officer) performing a behaviour believed to be stereotypical of the group (e.g. uses violence when making an arrest). On each trial, in these two sentences both the group and the stereotypical behaviour could be repeated, only the group or only the stereotypical behaviour, or neither. At the second sentence, the participants were asked to score the degree to which the behaviour was typical of the group. We recorded the suppression of the hemodynamic signal during the second sentences. Results showed a suppression of activation in the mPFC in response to the repetition of stereotypical behaviour. A suppression effect for the repetition of groups was observed in the right inferior parietal lobule. The findings relating to stereotypes are in line with similar repetition research on trait attributions. We make several suggestions for future research regarding the unexpected suppression effect for groups.

11:50am - 12:10pm

The contribution of the left inferior frontal gyrus to the lexical-semantic representation of social categories: A TMS investigation of the relevance of affective processing

T. Suran[1], R. Rumiati[2], L. Piretti[1]
[1]Area of Neuroscience, International School for Advanced Studies, Italy; [2]ANVUR, Italy

Building on clinical studies reporting patients with an impaired knowledge about social categories following brain damage, we explored the contribution of a specific cortical area in supporting their semantic representation, namely, the pars opercularis of the left inferior frontal gyrus (LIFGop). In doing so, we combined paired-pulse transcranial magnetic stimulation (TMS) with a semantic priming paradigm requiring healthy right-handed subjects to categorize target words preceded by a semantically congruent or incongruent prime. Following the hypothesis by which the representation of social categories would rely on the processing of affective features, as opposed to non-social objects – relying more on areas processing praxis information, we further manipulated the valence of the target words. The reported greater LIFGop activity when processing negative words led us to expect its stimulation to affect participant's responses to social category words of that same valence. As hypothesized, in comparison to the vertex as a control site, the stimulation of the LIFGop led to a disruption of the semantic priming effect only for negative valence words related to social categories. This disruption, characterized by a decrease in reaction times when categorizing targets preceded by incongruent primes, suggests that the area may support the activation of the representation of social categories through the processing of affective features. In the light of the findings, it is proposed that the ability to semantically represent and differentiate among conspecifics at the level of social categories may lie in the affective response we learn to associate different groups of people with.

Session

Psychopathology

Time: **Sunday, 22/Jul/2018: 11:10am - 12:10pm**

Location: **CZ-2**

Session Chair: **Colline Poirier**

11:10am - 11:30am

Diagnostic accuracy of frontotemporal dementia. An artificial intelligence-powered study of symptoms, imaging, and clinical judgement.

M. A. Brzezicki[1], M. D. Kobetic[2], S. Neumann[3], C. Pennington[1]
[1]Bristol Institute of Clinical Neurosciences, University of Bristol, United Kingdom; [2]Faculty of Health Sciences, University of Bristol, United Kingdom; [3]Department of Physiology and Pharmacology, Clinical Research and Imaging Centre, University of Bristol, UK

Frontotemporal dementia (FTD) is a neurodegenerative disorder associated with a poor prognosis and a substantial reduction in quality of life. The rate of misdiagnosis of FTD is very high, with patients often waiting for years without a firm diagnosis. Recent advances in the field of computational biology have shown that artificial intelligence algorithms can play a key role in the pattern recognition of various disease states.An artificial intelligence algorithm has been developed to retrospectively analyse the patient journeys of 47 individuals diagnosed with FTD (age range 52-80). The algorithm analysed the efficiency of patient pathways by utilizing a reward signal of ?1 to +1 to assess the symptoms, imaging techniques, and clinical judgement in both behavioural and language variants of the disease.On average, every patient was subjected to 4.93 investigations, of which 67.4% were radiological scans. From first presentation it took on average 939 days for a firm diagnosis. The mean time between appointments was 204 days, and the average patient had their diagnosis altered 7.37 times during their journey.The algorithm proposed improvements by evaluating the interventions that resulted in a decreased reward signal to both the individual and the population as a whole.The study proves that the algorithm can efficiently guide clinical practice and improve the accuracy of the diagnosis of FTD whilst making the process of auditing faster and more economically viable.

11:30am - 11:50am

Too tired to work: A computational framework of momentary motivational and subjective fatigue

M. A J Apps, T. Mueller, M. Jurgelis, M. Husain
Experimental Psychology, University of Oxford, United Kingdom

Fatigue - a feeling of exhaustion arising from exertion – is one of the most common symptoms in primary medicine and is highly prevalent in Parkinson's Disease (PD). Healthy people also show effects of fatigue after exertion – with

accuracy and vigour declining with time-on-task. Prominent theories propose that fatigue increases after effort, declines through rest, and that this fluctuating subjective "feeling" impacts on the willingness to exert effort. However, formal models that can account for fluctuations in both the feeling (subjective fatigue) and in its effects on the willingness to exert effort (motivational fatigue) have never been put forward. As a result, our understanding of typical fatigue and the mechanisms underlying it in PD is poor. Here, I put forward a computational framework of momentary fatigue and test its ability to explain the subjective feeling of fatigue and motivational fatigue in an effort-based decision-making task. I present evidence that this model can precisely quantify trial-to-trial changes in (i) subjective ratings of fatigue and (ii) people's willingness to put in effort to obtain rewards in healthy young people (n = 60). Moreover, I show that this model can provide a computational signature of impaired motivation in PD patients relative to controls (n = 35) and can reveal new insights into the neural mechanisms underlying fatigue and the dynamics of motivation.

11:50am - 12:10pm

The cumulative experience hypothesis of mood disorders.

C. Poirier, M. Bateson
Institute of Neuroscience, Newcastle University, United Kingdom

Hippocampus reduction has been associated with many stress-related mood disorders. Here, taking a broader view on the role of the hippocampus, in health and disease, we will describe published evidence in humans and animal models showing that the amount of grey matter in the anterior hippocampus co-varies with negative and positive affective experiences in a dose-dependent and cumulative way over long periods of time. These properties lead us to propose that the accumulation of negative experiences across the lifetime, when not compensated by positive experiences, induces a reduction in the amount of grey matter in the anterior hippocampus which beyond a certain threshold provokes mood disorders. This theory allows us to reconcile conflicting data on the trait versus state debate of the hippocampal reduction observed in patients suffering from mood disorders. It also suggests that promoting hippocampus-enhancing positive experiences might be an effective way to prevent stress-related mood disorders in at-risk subjects.

Session

Decision making

Time: **Sunday, 22/Jul/2018: 11:10am - 12:10pm**

Location: **CZ-3**

Session Chair: **Blanca Rosa Olalde Lopez de Arechavaleta**

11:10am - 11:30am

Individual differences in intuitive and analytical thinking

B. R. Olalde Lopez de Arechavaleta
Department of Developmental and Educational Psychology. Faculty of Education, Philosophy and Anthropology. The University of the Basque Country, UPV/EHU.Spain

Judgments and decision-making are carried out through a combination of Type 1 (intuitive) and Type 2 (analytic) thinking. The Cognitive Reflection Test (CRT) is one of the most widely used tools to assess individual differences in intuitive–analytic thinking. The standard version of the CRT is made up of three problems but an expanded seven-item version of the test is also extensively used. The long version of CRT is composed of the three original items and four new items. Each question prompts an easy and intuitive but incorrect answer, and a correct answer that involves analytical processing. The purpose of this study is to use both the standard and long-version of the Cognitive Reflection Test (CRT) to evaluate and compare the level of Type 1 and 2 thinking. This study aims to find relationships between CRT scores and time performance, gender performance, age and level of education. The study shows that subjects' performance in extended CRT version is positively correlated with performance in the original CRT. Likewise, our findings support the hypothesis that fast responses are associated with incorrect answers.

11:30am - 11:50am

Measuring emotional granularity through consistency in emotional decision-making.

C. F. Huggins, J. Williams, I. Cameron
Institute of Medical Sciences, University of Aberdeen, United Kingdom

Emotional granularity, the ability to differentiate between different emotions, is usually assessed through self-report in autism. However, there is evidence of discrepancies between self- and other-reported granularity in autism, indicating more objective measures are necessary. This study piloted a novel, objective measure of emotional granularity based on consistency in emotional decision-making. It was assumed that more consistent decisions would indicate greater ability to differentiate between similar emotional experiences. 67 undergraduate students viewed 66 pairs of unpleasant emotional images from the Nencki Affective Picture System, selecting the image they found they found more upsetting for each. This procedure was repeated with pleasant images. The number of times each image was chosen represented the image's 'score'. For each pair, the ignored item's score was subtracted from the selected item's score. Subsequent values were summed, producing consistency scores. Consistency was compared to self-reported autistic traits, and emotional granularity calculated from an image response task. Consistency was higher than anticipated, with 7.5% and 10.4% of participants scoring perfect negative and positive emotional consistency respectively. Negative consistency was significantly correlated with negative granularity, but positive consistency was unrelated to positive granularity. Autistic traits were associated with higher positive consistency, but lower negative consistency. While consistency in emotional decision-making may act as an objective measure of emotional awareness, consistency was considerably higher than anticipated. Quantity of stimuli make it unlikely this was due to memory. Furthermore, positive and negative consistency seemed to be dissociable, and differentially related to autistic traits.

11:50am - 12:10pm

Emotional prospection and decision-making

A. Bulley[1], B. Miloyan[2], G. Pepper[3], M. J Gullo[4], J. D Henry[1], T. Suddendorf[1]
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Humans frequently create mental models of the future, allowing prospective conditions to be inferred in advance. Recent evidence suggests that imagining positive future events can reduce delay discounting (the devaluation of reward with time until its receipt), while imagining negative future scenarios can increase it. Using a sample of 297 participants, we assessed the potential effects of imagining emotional future scenarios (e.g. promising vs. harsh events) on decision-making in the context of both delay discounting and risk-taking. We found that imagining positively and negatively valenced future scenarios was associated with reduced delay discounting relative to neutral imagery, but did not affect risk-taking during standard laboratory choice tasks. Thus, although these results replicate previous findings suggesting episodic future simulation can reduce delay discounting, they indicate that this effect may not be dependent on the valence of the thoughts, and may not generalise to other forms of 'impulsive' decision-making such as risk-taking. We discuss various interpretations of these results, and suggest avenues for further research on the role of prospection in decision-making.

Session

Emotion regulation

Time: **Sunday, 22/Jul/2018: 11:10am - 12:10pm**

Location: **CZ-4**

Session Chair: **Corinna M. Perchtold**

11:10am - 11:30am

The role of the right amygdala in emotion regulation: A human lesion study

L. Pruessner[1,2], S. Barnow[1], R. Freitag[1], K. Schulze[1]

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Learning how to control emotions is at the heart of treatments for affective psychopathology. Neuroimaging studies suggest an essential role of the neural network between the amygdala and the prefrontal cortex for emotion regulation. However, to date, there are no lesion studies supporting this notion. Thus, it remains unclear whether the amygdala is necessary for emotion regulation. To address this research gap, we investigated a neurological patient with a rare unilateral right-hemispheric lesion of the amygdala as well as neurologically healthy matched controls (n = 31, age range: 42-52, male). All participants were screened for psychopathology and completed a battery of tasks on cognitive functioning (e.g., memory, verbal IQ), general emotion processing abilities (e.g., reactivity, recognition), and self-report measures as well as an experimental paradigm on emotion regulation (e.g., reappraisal, suppression, acceptance). Consistent with previous literature, the lesion patient showed a reduced emotion recognition ability as well as a lower intensity of self-reported negative emotions. Interestingly, however, the patient revealed no impairment in emotion regulation abilities despite the damage to the amygdala. This finding was consistent across multiple emotion regulation measures including self-report and experimental tasks. Bayesian statistical models further revealed that these effects remained stable, even after controlling for emotion recognition, working memory, and long-term memory abilities. Our preliminary results provide first empirical evidence of unimpaired emotion regulation after a right-hemispheric amygdala lesion. We conclude that the lesion method provides a promising approach of complementing functional neuroimaging research on the neural underpinnings of emotion regulation.

11:30am - 11:50am

The reappraisal inventiveness of the brain: Neural underpinnings of a new ability concept in cognitive reappraisal research

C. M. Perchtold[1], H. Weber[2], A. Fink[1], E. M. Weiss[1], C. Rominger[1], I. Papousek[1]

[1]Department of Psychology, University of Graz, Austria; [2]Department of Psychology, University of Greifswald, Germany

Reappraisal inventiveness constitutes a novel ability concept in cognitive reappraisal research, measuring what individuals are maximally capable of when reappraising emotionally evocative situations. Modelled after divergent thinking tests in the creativity domain, the Reappraisal Inventiveness Test bridges a critical gap in emotion regulation research by probing individuals' actual capacities to create many alternative appraisals for adverse scenarios, which are remarkably unrelated to their self-reported reappraisal habits. By conducting three EEG studies with different samples, we performed a comprehensive neurophysiological validation of the behavioral test for reappraisal inventiveness. We found that a) individuals higher on reappraisal inventiveness showed more left-lateralized activity in the lateral prefrontal cortex (EEG alpha asymmetry) while generating cognitive reappraisals for anger-evoking situations, b) less left-lateralized frontal brain activation during reappraisal attempts predicted lower well-being in terms of greater chronic stress perception in daily life, even when controlling for individuals' self-perceived efficacies in managing negative affect, and c) this inadequate engagement of the left lateral prefrontal cortex in the reappraisal process was further associated with more hostile and suspicious personality traits. These findings suggest that individuals higher on the capacity for cognitive reappraisal are more prone to recruit appropriate brain activation when tasked with inventing alternative interpretations of negative events. Moreover, they also connote that these inter-individual differences can have a tangible impact on individuals' affective well-being and might even foster certain maladaptive personality traits in the long run. Implications include the selection of more individually targeted interventions to counteract psychopathological developments.

11:50am - 12:10pm

Memory control and emotion regulation

S. Nørby

Danish school of education, Aarhus University, Denmark

Can people control their memories and thereby regulate their emotions? Emotion regulation comprises attempts to influence the experience and expression of emotions. Traditionally, such regulation has been conceived of as proactive (e.g., situation selection) or reactive (e.g., attentional distraction), but I propose that it may also be retroactive and target memory. I term such past-oriented activity mnemonic emotion regulation and suggest that it may involve increasing (e.g., rehearsing a pleasant memory) or decreasing (e.g., suppressing an unpleasant memory) access to or changing the characteristics (e.g., replacing negative impressions with positive interpretations) of a memory. I consider research that bear on these possibilities (e.g., on elaborate rehearsal). In addition, I reflect on the different motives (e.g., hedonic reasons) people may have for engaging in mnemonic emotion regulation.

Session

Agency

Time: **Sunday, 22/Jul/2018: 11:10am - 12:10pm**

Location: **CZ-5**

Session Chair: **Francesca Ciardo**

11:10am - 11:30am

Reduced sense of agency in human-robot interaction

F. Ciardo[1], F. Beyer[2], D. De Tommaso[1], A. Wykowska[1]

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In the presence of others, sense of agency (SoA), i.e. the perceived relationship between our own actions and external events, is reduced. This effect is thought to contribute to diffusion of responsibility. The present study aimed at examining humans' SoA when interacting with an artificial embodied agent. Thirty adults participated in a task alongside the Cozmo robot (Anki Robotics). Participants were asked to perform costly actions (i.e. losing various amounts of points) to stop an inflating balloon from exploding. In 50% of trials, only the participant could stop the inflation of the balloon ("individual condition"). In the remaining trials, both Cozmo and the participant were in charge of preventing the balloon from exploding ("joint condition"). The longer the players waited before pressing the "stop" key, the smaller amount of points were subtracted. However, in case the balloon exploded, participants would lose the largest amount of points. In the joint condition, no points were lost if Cozmo stopped the balloon. At the end of each trial, participants rated how much control they perceived over the outcome of the trial. Results showed that participants lost overall fewer points in the joint compared to the individual condition, reflecting a tendency to minimize losses when Cozmo could act. Moreover, when they successfully stopped the balloon, participants rated their SoA lower in the joint than in the individual condition, independently of the amount of lost points. This suggests that interacting with artificial agents affects SoA, similarly to interacting with other humans.

11:30am - 11:50am

Temporal dynamics of rubber and virtual hand illusions

O. Perepelkina[1,2], V. Vorobeva[2], O. Melnikova[2], G. Arina[2], V. Nikolaeva[2]

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Body ownership depends on convergent input of multimodal stimuli from visual, tactile, kinesthetic and other modalities. By manipulating of these sensory inputs we can investigate mechanisms of body ownership like it was in a "rubber hand illusion", one of somatosensory or body illusions. Dynamics of onset and fading of these illusions is an important research question. The aim of this study was to investigate the temporal dynamics of two body illusions: a static rubber hand illusion (RHI) and a moving virtual hand illusion (VHI). Thirty-three healthy subjects participated in this experiment. The comparison of two types of illusions allowed us to directly test the contribution of different modalities in body ownership and to compare two types of multisensory integration processes, tactile-visual and kinesthetic-visual integration. Two methods were used for illusions estimation: a subjective measure (ownership questionnaire), and a behavioral measure (proprioceptive drift evaluation). The general dynamics of proprioceptive drift were similar in both illusions: during the onset phase of artificial hand representation proprioceptive drift gradually increased, and during the fading phase proprioceptive drift gradually decreased. Subjective sense of ownership of an artificial hand was found in both illusions (test questions were significantly higher than control), but positive dynamics of the ownership was found in the RHI but not in the VHI. As well, subjective experience of the ownership illusion was higher towards the RHI, but not to the VHI. A kinematic analysis of the moving VHI revealed several motion features (such as jerk, smoothness and velocity), predicted illusion measures.

11:50am - 12:10pm

Only following orders? Differences in agency among civilians and military service members under coercion

E. A. Caspar[1,2], S. Lo Bue[3], P. A. Magalhães De Saldanha da Gama[2], P. Haggard[4], A. Cleeremans[2]

[1]Social Brain Lab, Netherlands Institute for Neuroscience, Belgium; [2]Center for Research in Cognition and Neurosciences, Université libre de Bruxelles; [3]Royal Military Academy; [4]Action and Body Group, University College London

Some social structures, such as armed forces, depend on strict hierarchical organisation where people are required to follow orders. Here we investigated whether the hierarchical structure of military command influences the sense of agency. We compared a group of cadets to civilian in a classical obedience scenario. Participants were tested in pairs. One volunteer served as 'agent' and the other as 'victim', in a situation where the agent administered painful electrical shocks to the victim, either freely or following the order or the experimenter. To ensure reciprocity, participants switched roles during the experiment. Sense of agency was assessed with an implicit measure based on mental chronometry. Civilian participants showed reduced sense of agency in coercion compared to free-choice conditions, replicating previous results. However, this difference was absent for the cadets who had a reduced sense of agency in both the free-choice and the coercive conditions. Interestingly, both civilian and cadets showed a reduction of the amplitude of the auditory N1 in the coercive condition, suggesting dissociation between subjective experience of agency under coercion and sensory suppression in the military cadets. Our behavioural results suggest that a sense of agency and a level of individual autonomy may be impacted within the social structures of military command, and may even underpin it.

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Colzato, Lorenza S.	SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential Presenter SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off

Author(s)	Session
	Lunch & Poster Session II SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation Lunch & Poster Session I Lunch & Poster Session II Lunch & Poster Session I
Comasco, Erika	Lunch & Poster Session II Lunch & Poster Session II
Cools, Roshan	SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off Presenter
Cooper, Nicole	Lunch & Poster Session I
Corcoran, Katja	Social attention
Cordeiro de Sousa, Maria Bernardete	Lunch & Poster Session II Lunch & Poster Session I
Cristoforetti, Giulia	Lunch & Poster Session I
Critchley, Hugo D.	Lunch & Poster Session II
Crockett, Molly	SYMPOSIUM - Reinforcement learning in a social world
Crowley, Michael J.	SYMPOSIUM - The social neuroscience of human attachment
Crucianelli, Laura	SYMPOSIUM - The Balance between You and Me: Integrating social, affective and embodied approaches to the self-other distinction Presenter
Csépe, Valéria	Lunch & Poster Session I
Cui, Xu	SYMPOSIUM - The social neuroscience of human attachment
Cullen, Brendan	SYMPOSIUM - Affective influences on cognitive control: Psychological processes
Cushman, Fiery	SYMPOSIUM - Reinforcement learning in a social world
Czigler, István	Lunch & Poster Session I
D'Agostini, Martina	Lunch & Poster Session II Presenter
Da Fonseca, David	Lunch & Poster Session II
Dahan, Albert	SYMPOSIUM - How motivational and learning processes shape pain and avoidance
Dahinden, Franziska M.	Lunch & Poster Session II Presenter
Dainer-Best, Justin	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
Dantas, Aline Mirella	Lunch & Poster Session II Presenter
Davidesco, Ido	Lunch & Poster Session I
Davin, Tanguy	Lunch & Poster Session II
Davis, Marcus Jay	Face perception Presenter
Dazzi, Federico	Lunch & Poster Session I
Dańczura, Ewa	Lunch & Poster Session I
De Beukelaer, Sophie	SYMPOSIUM - The social brain in context: How we (dis)engage with socio-political issues Lunch & Poster Session I
De Dreu, Carsten	Lunch & Poster Session I Decision making
De Raedt, Rudi	SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation
De Tommaso, Davide	Agency
De Winter, François-Laurent	SYMPOSIUM - You only know when it's gone: neural (network) and behavioral effects of amygdalar lesions
De Zorzi, Lucas	Lunch & Poster Session I Presenter
Decety, Jean	Lunch & Poster Session II
Delevoye-Turrell, Yvonne	Cognitive control Lunch & Poster Session II
Delplanque, Jeroen	Social representation Presenter
Demarchi, Gianpaolo	Lunch & Poster Session II Lunch & Poster Session I
Demel, Ronja Katharina	Lunch & Poster Session I Presenter Lunch & Poster Session I
Demurie, Ellen	Autism
Deng, Huihua	Social cognition II
Denkova, Ekaterina	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
Derakhshan, Nazanin	SYMPOSIUM - A failure to filter threat?: How bottom-up and top-down control processes contribute to the expression and regulation of fear and anxiety Presenter
Deruelle, Christine	Lunch & Poster Session II

Author(s)	Session
Desenclos, Isabelle	Lunch & Poster Session II
Dewaele, Nele	Autism
Dezecache, Guillaume	Lunch & Poster Session I
Dikker, Suzanne	Lunch & Poster Session I Presenter
Dinca, Andreea	Lunch & Poster Session II
Ding, Mingzhou	Lunch & Poster Session I
Dolcos, Florin	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions Lunch & Poster Session II SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions Presenter Lunch & Poster Session I
Dolcos, Sanda	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions Lunch & Poster Session I Presenter
Domaradzka, Ewa	Lunch & Poster Session II
Dominey, Peter Ford	SYMPOSIUM - From social cognitive neuroscience to robotics and back – what can we learn from bidirectional links between these disciplines Presenter
Donati, Alessia	Lunch & Poster Session I
Donati, Georgina	Lunch & Poster Session I Presenter
Doré, Bruce	Lunch & Poster Session I
Dreisbach, Gesine	SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off
Dreneva, Anna	Lunch & Poster Session I Presenter
Dubal, Stéphanie	SYMPOSIUM - Self-voice perception and its role in autism and auditory hallucinations
Dubey, Indu	SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach
Duka, Theodora	Lunch & Poster Session II
Dumontheil, Iroise	Lunch & Poster Session I
Durston, Sarah	SYMPOSIUM - Heterogeneity in autism spectrum disorders
Dziobek, Isabel	Face perception
D'Ippolito, Mariagrazia	Lunch & Poster Session I
Eder, Andreas B.	SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control Presenter
Édes, Andrea Edit	Lunch & Poster Session II Lunch & Poster Session II Lunch & Poster Session I
Eickhoff, Simon B.	Social cognition II
Eijlers, Esther	Lunch & Poster Session I Presenter
Eikemo, Marie	SYMPOSIUM - Recent developments in the neuropsychology of flavor processing
Ein-Dor, Tsachi	SYMPOSIUM - The social neuroscience of human attachment
Eisenegger, Christoph	SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach
Ekmanis, Janis	Lunch & Poster Session II Presenter
El Bouragui, Khira	Lunch & Poster Session II Presenter
El Zein, Marwa	Perception and emotion
Elliott, Rebecca	Lunch & Poster Session II
Emmerling, Franziska	The self
Engel, Andreas	Memory
Engelbert, Lara	Lunch & Poster Session II
Engen, Haakon Gabrielsen	Lunch & Poster Session II Presenter
Enock, Florence Elizabeth	The self Presenter
Eo, Jinseok	Lunch & Poster Session II
Eom, Soyong	Lunch & Poster Session I Presenter Lunch & Poster Session II Lunch & Poster Session II
Era, Vanessa	SYMPOSIUM - Interactive brains: neural mechanisms of two-person social interaction Presenter Lunch & Poster Session II
Erica, Santelli	SYMPOSIUM - Heterogeneity in autism spectrum disorders
Erkan, Salih	Lunch & Poster Session II

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Eskenazi, Terry	Lunch & Poster Session I
Esposito, Gianluca	Empathy
Esteves, Francisco	Lunch & Poster Session II Lunch & Poster Session I Presenter
Evans, Samuel	SYMPOSIUM - Self-voice perception and its role in autism and auditory hallucinations
Fajkowska, Małgorzata	Lunch & Poster Session II
Falk, Emily	Lunch & Poster Session I
Farb, Norman	Lunch & Poster Session II Lunch & Poster Session I
Farina, Andrea	Lunch & Poster Session I Presenter
Feng, Chunliang	Social cognition II
Ferdenzi Lemaitre, Camille	Lunch & Poster Session I
Fernandes, Carina	Decision making Presenter
Fernyhough, Charles	SYMPOSIUM - Self-voice perception and its role in autism and auditory hallucinations
Fernández-Folgueiras, Uxía	Lunch & Poster Session II Presenter Lunch & Poster Session II
Ferrari, Chiara	SYMPOSIUM - The Social Cerebellum: New insights and evidence Presenter
Ferreira-Santos, Fernando	SYMPOSIUM - Predictive processing approaches in affective neuroscience Presenter SYMPOSIUM - Interactive brains: neural mechanisms of two-person social interaction Decision making
Field, David T.	Perception and emotion
Figner, Bernd	SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control
File, Domonkos	Lunch & Poster Session I
Fink, Andreas	Emotion regulation Lunch & Poster Session I
Fischer, Håkan	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Fischer, Rico	SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential Presenter
Flor, Herta	Lunch & Poster Session I Lunch & Poster Session II
Focella, Lucia	Lunch & Poster Session II Presenter
Fondevila, Sabela	Lunch & Poster Session II Lunch & Poster Session II
Forbes, Paul	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing Presenter
Fossati, Philippe	Lunch & Poster Session I
Fotopoulou, Aikaterini	SYMPOSIUM - Putting interoception at the heart of social cognition: Addressing methodological, conceptual and research challenges Presenter Autism
Foulkes, Lucy	Social cognition II Presenter
Fox, Elaine	Lunch & Poster Session I Lunch & Poster Session II
Franken, Ingmar H. A.	Empathy
Frankowska, Natalia	Lunch & Poster Session I
Frassinetti, Francesca	SYMPOSIUM - Heterogeneity in autism spectrum disorders Presenter SYMPOSIUM - Heterogeneity in autism spectrum disorders Lunch & Poster Session II Lunch & Poster Session I
Freitag, Rosalux	Emotion regulation
Fresnoza, Shane	Social attention
Friedrich, Julia	Lunch & Poster Session I Presenter Lunch & Poster Session I Presenter
Frouin, Vincent	SYMPOSIUM - Heterogeneity in autism spectrum disorders
Fröber, Kerstin	SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off Presenter
Frühholz, Sascha	SYMPOSIUM - You only know when it's gone: neural (network) and behavioral effects of amygdalar lesions Presenter
Fuhrmann, Delia	Social cognition II
Gabay, Shai	Social attention
Gabrieli, Giulio	Empathy Presenter

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Galambos, Attila	Lunch & Poster Session II Lunch & Poster Session II Lunch & Poster Session I
Gallese, Vittorio	The self Face perception
Gallo, Selene	Lunch & Poster Session I
Gallucci, Alessia	Social decision making
Galvez-Pol, Alejandro	Autism
García-Rubio, María J.	Lunch & Poster Session II
Gazzola, Valeria	Lunch & Poster Session II Lunch & Poster Session I
Gaál, Zsófia Anna	Lunch & Poster Session I Presenter
Ge, Sheng	Social cognition II
Geissberger, Nicole	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Gentsch, Antje	Perception and emotion
Georgescu, Alexandra	SYMPOSIUM - Interactive brains: neural mechanisms of two-person social interaction SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach
Germani, Alessandro	The self
Gerritsen, Roderik	Lunch & Poster Session I Presenter
Getzmann, Stephan	Lunch & Poster Session I Presenter Attention
Ghazal, Pasha	Memory Presenter
Gheza, Davide	SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation Presenter
Gianotti, Lorena R.R.	Lunch & Poster Session II Lunch & Poster Session I
Giffin, Michael Rojek	Decision making Presenter Lunch & Poster Session I
Giller, Franziska	Lunch & Poster Session II Presenter
Giménez-Fernández, Tamara	Lunch & Poster Session II Presenter Lunch & Poster Session II
Giuberti, Virginia	SYMPOSIUM - Heterogeneity in autism spectrum disorders
Gjoneska, Biljana	Social decision making Presenter
Goerlich, Katharina Sophia	SYMPOSIUM - Heterogeneity in autism spectrum disorders Presenter
Gonçalves, Ana	Decision making
Grabowska, Anna	Memory
Granwald, Tobias	SYMPOSIUM - Reinforcement learning in a social world
Grisetto, Fanny	Lunch & Poster Session II
Grisetto, Fanny	Cognitive control Presenter
Gromer, Daniel	SYMPOSIUM - How motivational and learning processes shape pain and avoidance
Gross, Jorg	Lunch & Poster Session I Decision making
Grèzes, Julie	Lunch & Poster Session I Perception and emotion SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control
Grössing, Alexander	SYMPOSIUM - Heterogeneity in autism spectrum disorders Lunch & Poster Session II
Guillard, Celia	SYMPOSIUM - The social brain in context: How we (dis)engage with socio-political issues
Guldner, Stella	Lunch & Poster Session II Presenter
Gullo, Matthew J	Decision making
Gvirts, Hila	Lunch & Poster Session I
Gómez-Ariza, Carlos J.	Lunch & Poster Session I
Haegens, Saskia	Lunch & Poster Session I
Haggard, Patrick	Agency
Hamilton, Antonia	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing SYMPOSIUM - Interactive brains: neural mechanisms of two-person social interaction SYMPOSIUM - Interactive brains: neural mechanisms of two-person social interaction Presenter SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach Presenter

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Hamm, Alfons O.	Lunch & Poster Session II SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential
Han, Shihui	Lunch & Poster Session II Lunch & Poster Session II
Hare, Todd A.	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice
Harjunen, Ville	Social decision making
Harris, Lasana	Social cognition I SYMPOSIUM - The social brain in context: How we (dis)engage with socio-political issues Presenter
Harrison, Neil	Lunch & Poster Session II
Hartmann, Helena	SYMPOSIUM - Heterogeneity in autism spectrum disorders Lunch & Poster Session II
Hashemi, Mahur	SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control
Hatfield, Timothy Rex	Autism Presenter
He, Xun	Social attention
Hedda, Lausberg	Psychopathology
Heijnen, Saskia	Lunch & Poster Session I Presenter
Heimann, Katrin Simone	Face perception
Hein, Grit	SYMPOSIUM - Reinforcement learning in a social world Presenter
Heleven, Elien	Social representation Presenter
Helmich, Ingo	Psychopathology Presenter
Henry, Julie D	Decision making
Herbert, Cornelia	Lunch & Poster Session I
Herman, Aleksandra Maria	Lunch & Poster Session II Presenter
Hermans, Erno	Lunch & Poster Session II
Hernández-Lorca, María	Lunch & Poster Session II
Hertel, Paula	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
Heslenfeld, Dirk	Lunch & Poster Session II
Hewstone, Miles Ronald Cole	The self
Hoare, Shannon	Lunch & Poster Session II
Hodossy, Lilla	SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential Presenter
Hoehl, Stefanie	SYMPOSIUM - The social neuroscience of human attachment
Hommel, Bernhard	Lunch & Poster Session II Lunch & Poster Session II Cognitive control Presenter SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off Lunch & Poster Session II Lunch & Poster Session I Lunch & Poster Session I
Honoré, Jacques	Lunch & Poster Session I
Horner, Aidan	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
Horstmann, Annette	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice Presenter
Horváth, János	Lunch & Poster Session II Presenter
Horváth, Kata	Lunch & Poster Session II
Hosseini, Hadi	SYMPOSIUM - The social neuroscience of human attachment
Hu, Yifan	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
Huang, Yun-An	SYMPOSIUM - You only know when it's gone: neural (network) and behavioral effects of amygdalar lesions Presenter
Hubinger, Mareike	SYMPOSIUM - Heterogeneity in autism spectrum disorders Lunch & Poster Session II

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Huggins, Charlotte Frances	Decision making Presenter Autism Presenter
Hulsman, Anneloes	SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control
Humphreys, Glyn William	The self
Humphreys, Glyn	SYMPOSIUM - Reinforcement learning in a social world
Husain, Masud	Psychopathology
Hutzinger, Clemens	Social attention
IJzerman, Hans	Social cognition I Presenter
Iachini, Tina	Lunch & Poster Session I
Iordan, Alexandru	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions Lunch & Poster Session I
Ioumpa, Kalliopi	Lunch & Poster Session I Presenter
Ischebeck, Anja	Social attention
Isomura, Tomoko	Lunch & Poster Session II Presenter
Jacucci, Giulio	Social decision making
Janacsek, Karolina	Lunch & Poster Session II
Jang, Changwon	Lunch & Poster Session II
Jansen, Myrthe	The self
Jauk, Emanuel	Social attention
Jauniaux, Josiane	Lunch & Poster Session II Presenter
Jednoróg, Katarzyna	Memory Lunch & Poster Session I
Jepma, Marieke	SYMPOSIUM - How motivational and learning processes shape pain and avoidance Presenter
Jo, Soo Won	Lunch & Poster Session II
Johnen, Ann-Kathrin	Lunch & Poster Session II Presenter
Johnstone, Tom	Face perception Lunch & Poster Session II
Jonas, Eva	Lunch & Poster Session I
Jongkees, Bryant J.	SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off Presenter Lunch & Poster Session II
Joo, Bonglim	Lunch & Poster Session I
Jover, Chloé	Lunch & Poster Session II
Juhasz, Gabriella	Lunch & Poster Session II
Juhász, Gabriella	Lunch & Poster Session II Lunch & Poster Session I
Julie, Grezes	Social cognition I
Junghoefer, Markus	SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation
Junghöfer, Markus	SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation
Juravle, Georgiana	SYMPOSIUM - A failure to filter threat?: How bottom-up and top-down control processes contribute to the expression and regulation of fear and anxiety
Jurgelis, Mindaugas	Psychopathology
Kaldewaij, Reinoud	SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control
Kalenscher, Tobias	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice
Kanske, Philipp	Lunch & Poster Session II
Kappas, Arvid	SYMPOSIUM - In memory of John T. Cacioppo Presenter
Karamountzos, Dimitrios	Lunch & Poster Session I
Kardos, Zsófia	Lunch & Poster Session II
Karthaus, Melanie	Lunch & Poster Session I Attention Presenter
Kasatkin, Vladimir	Lunch & Poster Session I
Katharina, Reinecke	Psychopathology
Kathmann, Norbert	SYMPOSIUM - Affective influences on cognitive control: Psychological processes

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Katsumi, Yuta	Lunch & Poster Session II SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions Lunch & Poster Session I
Kavcioglu, Fatih	SYMPOSIUM - How motivational and learning processes shape pain and avoidance
Kayhan, Ezgi	SYMPOSIUM - The social neuroscience of human attachment
Kazimirova, Evdokia	Lunch & Poster Session II Lunch & Poster Session I
Kecklund, Göran	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Kedia, Gayannee	Social attention Presenter
Keil, Andreas	SYMPOSIUM - A failure to filter threat?: How bottom-up and top-down control processes contribute to the expression and regulation of fear and anxiety
Kessel, Dominique	Lunch & Poster Session II
Kessler, Yoav	SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off
Keuper, Katharina	SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation
Keysers, Christian	Lunch & Poster Session II Lunch & Poster Session I
Khatibi, Ali	Lunch & Poster Session II
Kilner, James M	Autism
Kim, Diana Aleksandrovna	Lunch & Poster Session II Presenter
Kim, Jinyoung	Lunch & Poster Session II Presenter
Kim, Yeonhwa	Lunch & Poster Session II
King, John	Lunch & Poster Session I
Kirsch, Louise P.	SYMPOSIUM - The Balance between You and Me: Integrating social, affective and embodied approaches to the self-other distinction
Kissler, Johanna	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation Presenter
Klackl, Johannes	Lunch & Poster Session I
Klahn, Anna Luisa	SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation
Klein-Flugge, Miriam	SYMPOSIUM - Reinforcement learning in a social world
Klein, Annette Maria	SYMPOSIUM - The social neuroscience of human attachment
Kleinsorge, Thomas	Attention Presenter
Klinkenberg, Isabelle	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation Presenter SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation Presenter
Klumpers, Floris	SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control Presenter
Klöbl, Manfred	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Knapp, Brock	SYMPOSIUM - The social brain in context: How we (dis)engage with socio-political issues
Knoch, Daria	Lunch & Poster Session I Lunch & Poster Session II
Knoll, Lisa	Social cognition II
Koban, Leonie	SYMPOSIUM - How motivational and learning processes shape pain and avoidance Presenter
Kobetic, Matthew David	Psychopathology
Koch, Saskia	SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control
Kocsel, Natalia	Lunch & Poster Session II Lunch & Poster Session II Presenter Lunch & Poster Session I
Kokonyei, Gyongyi	Lunch & Poster Session II Presenter
Kolnes, Martin	Lunch & Poster Session I Presenter
Kompatsiari, Kyveli	Social attention Presenter
Konstantinova, Maria	Lunch & Poster Session II Presenter Lunch & Poster Session II Presenter Lunch & Poster Session I
Konvalinka, Ivana	SYMPOSIUM - Interactive brains: neural mechanisms of two-person social interaction Presenter

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Kool, Wouter	SYMPOSIUM - Reinforcement learning in a social world
Koppe, Georgia	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation
Korb, Sebastian	SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach Presenter
Kortink, Elise	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation
Kotz, Sonja A	SYMPOSIUM - Affective influences on cognitive control: Psychological processes Presenter SYMPOSIUM - Self-voice perception and its role in autism and auditory hallucinations
Kozak, Lajos R	Lunch & Poster Session II
Kozák, Lajos Rudolf	Lunch & Poster Session II Lunch & Poster Session I
Krabbendam, Lydia	Lunch & Poster Session II
Kraus, Christoph	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Kress, Laura	Lunch & Poster Session II Presenter
Kret, Mariska	Lunch & Poster Session I
Krishna, Anand	SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control
Krishnan-Barman, Sujatha	SYMPOSIUM - Interactive brains: neural mechanisms of two-person social interaction
Krishnan, Saloni	SYMPOSIUM - Self-voice perception and its role in autism and auditory hallucinations
Kroczek, Bartłomiej	Memory
Kroll, Aleksandra	Lunch & Poster Session I Presenter
Kronbichler, Martin	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Krueger, Frank	Social cognition II Presenter
Kulke, Louisa	Attention Presenter
Kunde, Wilfried	SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control
Kuo, Michael C.C.	Lunch & Poster Session I Presenter
Kuppens, Peter	Lunch & Poster Session I
Kóbor, Andrea	Lunch & Poster Session II Presenter
Kökönyei, Gyöngyi	Lunch & Poster Session II Lunch & Poster Session I
König, Jörg	Lunch & Poster Session II
L. Jackson, Philip	Lunch & Poster Session II
Laborde, Sylvain	Lunch & Poster Session II
Lackner, Helmut K.	Lunch & Poster Session I
Laghi, Fiorenzo	Lunch & Poster Session II
Lamm, Claus	SYMPOSIUM - The Balance between You and Me: Integrating social, affective and embodied approaches to the self-other distinction SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing Lunch & Poster Session II SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing SYMPOSIUM - In memory of John T. Cacioppo Presenter
Langenbach, Benedikt Peter	Lunch & Poster Session I Presenter
Lanzenberger, Rupert	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Larson, Christine	SYMPOSIUM - A failure to filter threat?: How bottom-up and top-down control processes contribute to the expression and regulation of fear and anxiety Presenter
Latanov, Alexander	Lunch & Poster Session II Lunch & Poster Session II
Lebreton, Mael	Decision making
Lee Masson, Haemy	Social cognition I Presenter
Lee, Sang-Hun	Lunch & Poster Session II
Lee, Youngjoon	Lunch & Poster Session I
Leggio, Maria	SYMPOSIUM - The Social Cerebellum: New insights and evidence Lunch & Poster Session II
Lekander, Mats	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing

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Leknes, Siri	SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach Presenter SYMPOSIUM - Recent developments in the neuropsychology of flavor processing Presenter SYMPOSIUM - How motivational and learning processes shape pain and avoidance Presenter
Lelieveld, Gert-Jan	Social cognition I Presenter
Leng, Yue	Social cognition II
Lenggenhager, Bigna	Lunch & Poster Session I
Leonor Josefina, Romero Lauro	Social decision making
Leung, Jovita	Social cognition II
Leutritz, Anna Linda	SYMPOSIUM - The social neuroscience of human attachment Presenter
Li, Meng	SYMPOSIUM - The social neuroscience of human attachment
Li, Xueqiao	Lunch & Poster Session I Presenter
Liepelt, Roman	The self Presenter
Lillie, Christine	SYMPOSIUM - The social brain in context: How we (dis)engage with socio-political issues
Lima, César	SYMPOSIUM - Self-voice perception and its role in autism and auditory hallucinations Presenter
Lindström, Björn	SYMPOSIUM - Reinforcement learning in a social world Presenter
Lippelt, Dominique	Lunch & Poster Session I
Liu, Karen P.Y.	Lunch & Poster Session I
Liu, Ning	SYMPOSIUM - The social neuroscience of human attachment
Liu, Yang	Lunch & Poster Session I Presenter
Liuzza, Marco Tullio	Social decision making
Lleras, Alejandro	Lunch & Poster Session I
Lo Bue, Salvatore	Agency
Lo Gerfo, Emanuele	Social decision making Presenter Attention
Locatelli, Gaia	Social decision making
Lockwood, Patricia Lorraine	SYMPOSIUM - Reinforcement learning in a social world Presenter ESCAN young researcher award lectures Presenter The self
Lockwood, Patricia L	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Loriedo, Camillo	Lunch & Poster Session I
Loseva, Alexandra	Lunch & Poster Session II Presenter
Loth, Eva	SYMPOSIUM - Heterogeneity in autism spectrum disorders SYMPOSIUM - Heterogeneity in autism spectrum disorders
Lotti, Enrico Maria	Lunch & Poster Session I
Lotze, Martin	Lunch & Poster Session II
Lucchiari, Claudio	Lunch & Poster Session II Presenter
Lumsden, Jim	Lunch & Poster Session I
Lupo, Michela	Lunch & Poster Session II
Ly, Angelique	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice
Ma, Jianhong	Decision making
Ma, Ke	Lunch & Poster Session II
Macdonald, Birthe	Lunch & Poster Session II Presenter
Machado, Paulo P. P.	Lunch & Poster Session I
Magalhães De Saldanha da Gama, Pedro A.	Agency
Maglione, Anton Giulio	Decision making
Maier, Silvia U.	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice Presenter
Mainetto, Elena	Lunch & Poster Session II
Malykh, Artem	Lunch & Poster Session I
Mangiaracina, Giulia	Lunch & Poster Session I Lunch & Poster Session II Presenter
Manto, Mario	SYMPOSIUM - The Social Cerebellum: New insights and evidence
Manwarring, Anne M	Lunch & Poster Session I
Maratos, Frances	Face perception

Author(s)	Session
Maraver, Maria J.	SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential
Maraver, Maria Jesus	Lunch & Poster Session I Presenter
Marchewka, Artur	Memory Lunch & Poster Session I
Marques-Teixeira, João	Decision making
Mars, Rogier	Empathy
Marshall, Amanda Claire	Perception and emotion Presenter
Martin, Andrew Kenneth	Empathy Presenter
Martins, Isabel P.	Decision making
Marton, Inbar-Zvia	Lunch & Poster Session I Presenter
Marucci, Matteo	Lunch & Poster Session I
Masciullo, Marcella	Lunch & Poster Session II
Massaccesi, Claudia	SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach SYMPOSIUM - Heterogeneity in autism spectrum disorders Lunch & Poster Session II Presenter
Massacesi, Claudia	SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach
Mather, Mara	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
Matsumori, Kaosu	Lunch & Poster Session II
Matsumoto, Kenji	Lunch & Poster Session II
Matsumoto, Madoka	Lunch & Poster Session II
Mattavelli, Giulia	Attention
Matthes, Daniel	SYMPOSIUM - The social neuroscience of human attachment
Matyjek, Magdalena	Memory
Maydych, Victoriya	Attention
Mazza, Veronica	Lunch & Poster Session I
Meaburn, Emma	Lunch & Poster Session I
Meaux, Emilie	Perception and emotion Presenter
Meert, Gaëlle	Lunch & Poster Session I
Mehl, Nora	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice
Meinzer, Marcus	Empathy
Mekern, Vera	SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off
Meliss, Stefanie	Lunch & Poster Session II Presenter
Melnikova, Olga	Agency
Mennella, Rocco	Lunch & Poster Session I Perception and emotion SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control Presenter
Metta, Giorgio	SYMPOSIUM - From social cognitive neuroscience to robotics and back – what can we learn from bidirectional links between these disciplines Presenter
Metzler, Hannah	Social cognition I Presenter
Meyer-Lindenberg, Andreas	SYMPOSIUM - Heterogeneity in autism spectrum disorders
Miloyan, Beyon	Decision making
Mitkidis, Panagiotis	SYMPOSIUM - The social brain in context: How we (dis)engage with socio-political issues Presenter
Moccia, Arianna	Lunch & Poster Session I Presenter
Modica, Enrica	Decision making
Moessnang, Carolin	SYMPOSIUM - Heterogeneity in autism spectrum disorders Presenter
Mohss, Axel	Lunch & Poster Session II Presenter
Moisa, Marius	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice
Mokry, Michal	SYMPOSIUM - The social neuroscience of human attachment
Molinari, Marco	Lunch & Poster Session II
Montoya, Estrella	Social cognition I
Moore, Harry	Lunch & Poster Session I Presenter
Moors, Agnes	SYMPOSIUM - Affective influences on cognitive control: Psychological processes Lunch & Poster Session II
Morese, Rosalba	Social decision making

Author(s)	Session
Morrison, India	Lunch & Poster Session I
Morriss, Jayne	SYMPOSIUM - A failure to filter threat?: How bottom-up and top-down control processes contribute to the expression and regulation of fear and anxiety
Morys, Filip	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice
Mueller, Erik M.	SYMPOSIUM - A failure to filter threat?: How bottom-up and top-down control processes contribute to the expression and regulation of fear and anxiety
Mueller, Tanja	Psychopathology
Munafò, Marcus	Lunch & Poster Session I
Murayama, Kou	Lunch & Poster Session II
Murphy, Declan	SYMPOSIUM - Heterogeneity in autism spectrum disorders
Murphy, Jennifer	SYMPOSIUM - Putting interoception at the heart of social cognition: Addressing methodological, conceptual and research challenges Presenter
Murrins, Lucas	Lunch & Poster Session II
Musrah, Andi	Lunch & Poster Session II Presenter
Méndez-Bértolo, Constantino	Lunch & Poster Session II Lunch & Poster Session II
Möller, Stefan	Lunch & Poster Session II
Mückschel, Mückschel	Lunch & Poster Session II Lunch & Poster Session I Lunch & Poster Session I Lunch & Poster Session I Presenter Lunch & Poster Session II Lunch & Poster Session I Presenter Lunch & Poster Session II
Müller, Bernhard	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
Münchau, Alexander	Lunch & Poster Session II
Naar, Richard	Lunch & Poster Session I
Naeeni Davarani, Mahsa	Face perception Presenter
Nafcha, Orit	Social attention Presenter
Nagy, Boglárka	Lunch & Poster Session I
Nees, Frauke	Lunch & Poster Session I Lunch & Poster Session II
Nele, Ollinger	Psychopathology
Nemeth, Dezso	Lunch & Poster Session II
Neumann, Sandra	Psychopathology
Nguyen, Quynh Trinh	SYMPOSIUM - The social neuroscience of human attachment Presenter
Nicolardi, Valentina	Lunch & Poster Session II Lunch & Poster Session I Presenter
Nikolaeva, Valentina	Agency
Nilsonne, Gustav	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Nitsche, Michel	Lunch & Poster Session II
Nolte, Tobias	SYMPOSIUM - The social neuroscience of human attachment
Notebaert, Wim	Psychopathology
Notzon, Swantje	SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation
Novembre, Giovanni	Lunch & Poster Session I Presenter
Nørby, Simon	Emotion regulation Presenter
O'Brien, Margaret	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
O'Brien, Margaret	Lunch & Poster Session I
Ociepka, Michał	Memory
Olalde Lopez de Arechavaleta, Blanca Rosa	Decision making Presenter
Olivito, Giusy	SYMPOSIUM - The Social Cerebellum: New insights and evidence Presenter Lunch & Poster Session II
Olsson, Andreas	SYMPOSIUM - Reinforcement learning in a social world
Olszanowski, Michal	Lunch & Poster Session I Presenter
Onnis, Luca	Empathy
Oosterwijk, Suzanne	Lunch & Poster Session II Presenter

Author(s)	Session
Pfabigan, Daniela M.	Lunch & Poster Session II Presenter
Piccinini, Gualtiero	Lunch & Poster Session I
Pillet, Ineke	Social cognition I
Pinal, Diego	Lunch & Poster Session I
Pinar, Elif	Lunch & Poster Session I Presenter
Pinheiro, Ana	SYMPOSIUM - Self-voice perception and its role in autism and auditory hallucinations Presenter
Pinti, Paola	SYMPOSIUM - Interactive brains: neural mechanisms of two-person social interaction
Piretti, Luca	Social representation
Piva Demarzo, Marcelo Marcos	Lunch & Poster Session I
Pletti, Carolina	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Pletti, Carolina	Lunch & Poster Session II Presenter
Poeppel, David	Lunch & Poster Session I
Pohlack, Sebastian	Lunch & Poster Session I
Poirier, Colline	Psychopathology Presenter
Ponari, Marta	Lunch & Poster Session I
Ponari, Marta	Lunch & Poster Session II
Ponzano, Ferruccio	Social decision making
Porciello, Giuseppina	Social decision making Lunch & Poster Session I
Pourtois, Gilles	SYMPOSIUM - Affective influences on cognitive control: Psychological processes Presenter SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation Lunch & Poster Session II
Prochazkova, Eliska	Lunch & Poster Session I Presenter
Prochazkova, Luisa	Lunch & Poster Session II Presenter Lunch & Poster Session I Presenter
Proulx, Travis	Lunch & Poster Session I
Provenzano, Julian	Lunch & Poster Session I Presenter
Provenzano, Luca	Lunch & Poster Session I Presenter
Pruessner, Luise	Emotion regulation Presenter
Pscherer, Charlotte	Lunch & Poster Session II Lunch & Poster Session I
Pärnamets, Philip	SYMPOSIUM - Reinforcement learning in a social world Presenter
Quaedflieg, Conny	Memory Presenter
Querzani, Pietro	Lunch & Poster Session I
Raab, Markus	Lunch & Poster Session II
Rabovsky, Milena	Social decision making
Rachman, Laura	SYMPOSIUM - Self-voice perception and its role in autism and auditory hallucinations Presenter
Rainville, Pierre	Lunch & Poster Session II
Ralph-Nearman, Christina	Lunch & Poster Session I
Ravaja, Niklas	Social decision making
Raw, Jasmine	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
Rebecca, Junge	Psychopathology
Rehbein, Maimu	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation Presenter SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation
Reicherts, Philipp	SYMPOSIUM - A failure to filter threat?: How bottom-up and top-down control processes contribute to the expression and regulation of fear and anxiety
Reiss, Allan	SYMPOSIUM - The social neuroscience of human attachment
Reiss, Stefan	Lunch & Poster Session I Presenter
Renberg Tamm, Sandra	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing Presenter
Ricciardelli, Paola	SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential Attention

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Richard Ortegon, Stéphane	Lunch & Poster Session I Presenter
Ridderinkhof, K. Richard	SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control Presenter Lunch & Poster Session I
Riegel, Monika	Memory Presenter Lunch & Poster Session I Presenter
Riem, Madelon	SYMPOSIUM - The social neuroscience of human attachment Presenter
Riesel, Anja	SYMPOSIUM - Affective influences on cognitive control: Psychological processes Presenter
Rigo, Paola	Empathy
Riva, Federica	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing Presenter
Robin, Marie-Sophie	Lunch & Poster Session I
Robinson, Oliver	Lunch & Poster Session I
Roelofs, Karin	SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control
Roessner, Veit	Lunch & Poster Session II Lunch & Poster Session II Lunch & Poster Session I
Roeyers, Herbert	Autism
Roger, Clémence	Cognitive control Lunch & Poster Session II Presenter
Rohr, Margund	SYMPOSIUM - The social neuroscience of human attachment
Romero Lauro, Leonor Josefina	Attention
Rominger, Christian	Emotion regulation Lunch & Poster Session I
Rose, Sebastian	Social decision making
Rosenberger, Lisa	SYMPOSIUM - Heterogeneity in autism spectrum disorders Lunch & Poster Session II
Rossi, Dario	Decision making
Rossignol, Mandy	Lunch & Poster Session II
Roy, Mathieu	SYMPOSIUM - How motivational and learning processes shape pain and avoidance
Ruff, Christian	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice SYMPOSIUM - The Balance between You and Me: Integrating social, affective and embodied approaches to the self-other distinction
Ruitenberg, Marit	Psychopathology Presenter
Rumiati, Raffaella Ida	Lunch & Poster Session II
Rumiati, Raffaella	SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach Social representation
Rushworth, Matthew	SYMPOSIUM - Reinforcement learning in a social world
Ruzzante, Daniela	Lunch & Poster Session I
Ryabova, Alena	Lunch & Poster Session I
Rädle, Marion	Lunch & Poster Session I
Rütgen, Markus	Lunch & Poster Session II SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing Presenter
Saarikallio, Suvi	Lunch & Poster Session I
Safra, Lou	SYMPOSIUM - The social brain in context: How we (dis)engage with socio-political issues Presenter
Saggar, Manish	SYMPOSIUM - The social neuroscience of human attachment
Sakaki, Michiko	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions Presenter Perception and emotion Lunch & Poster Session II
Sallet, Jerome	Empathy
Sampaio, Adriana	Lunch & Poster Session I
Samson, Dana	Lunch & Poster Session I
Santos, Isabel F.	Lunch & Poster Session I
Satpute, Ajay Bhaskar	SYMPOSIUM - Predictive processing approaches in affective neuroscience Presenter
Schacht, Annekathrin	Attention Lunch & Poster Session I
Schacht, Annekatrin	Lunch & Poster Session I

Author(s)	Session
Schellhaas, Sabine	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation
Schindler, Sebastian	SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation Presenter SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation
Schleihauf, Hanna	SYMPOSIUM - The social neuroscience of human attachment
Schmahl, Christian	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation
Schneider, Till	Memory
Scholte, Steven	Lunch & Poster Session II
Scholz, Christin	Lunch & Poster Session I Presenter
Schreiter, Marie Luise	Lunch & Poster Session I Presenter Lunch & Poster Session II Presenter
Schulter, Günter	Lunch & Poster Session I
Schulze, Katrin	Emotion regulation
Schurz, Matthias	Empathy Presenter
Schwabe, Lars	Memory
Schwartze, Michael	SYMPOSIUM - Self-voice perception and its role in autism and auditory hallucinations
Schwarz, Johanna	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Schweda, Adam	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice
Schüpbach, Laurent	Lunch & Poster Session II
Schütz-Bosbach, Simone	Perception and emotion
Scott, Sophie K	SYMPOSIUM - Self-voice perception and its role in autism and auditory hallucinations
Sebald, Albrecht	SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control
Sebanz, Natalie	Lunch & Poster Session I
Seidler, Rachael	Psychopathology
Sellaro, Roberta	Lunch & Poster Session II SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off Lunch & Poster Session II Lunch & Poster Session I
Sellitto, Manuela	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice Presenter
Senderecka, Magdalena	Memory Presenter
Sequeira, Henrique	Lunch & Poster Session I
Serino, Andrea	SYMPOSIUM - The Balance between You and Me: Integrating social, affective and embodied approaches to the self-other distinction Presenter
Severo, Mario Carlo	Lunch & Poster Session II SYMPOSIUM - Affective influences on cognitive control: Psychological processes
Shahzad, Salman	Psychopathology
Shamay-Tsoory, Simone	SYMPOSIUM - The Balance between You and Me: Integrating social, affective and embodied approaches to the self-other distinction Presenter Lunch & Poster Session I Social attention
Shanmugalingam, Pradheep	SYMPOSIUM - Self-voice perception and its role in autism and auditory hallucinations
Shedenko, Ksenia	Lunch & Poster Session II
Shin, Soogeun	Lunch & Poster Session II
Shtyrov, Yury	Lunch & Poster Session I
Siciliano, Libera	Lunch & Poster Session II
Siebert, Melinda M	Lunch & Poster Session I
Siegel, Judith Paula	Psychopathology Presenter Lunch & Poster Session II Presenter
Siehl, Sebastian Johannes	Lunch & Poster Session I Presenter
Silani, Giorgia	SYMPOSIUM - The Balance between You and Me: Integrating social, affective and embodied approaches to the self-other distinction SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach Presenter SYMPOSIUM - Heterogeneity in autism spectrum disorders Presenter Lunch & Poster Session II

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	SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Silva, Catarina	Lunch & Poster Session II Presenter
Simalla, Nicole	Psychopathology
Singer, Tania	Lunch & Poster Session II
Siri, Francesca	Face perception
Siu, Angela F. Y.	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation
Sjoerds, Zsuzsika	Lunch & Poster Session II
	SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off Presenter Lunch & Poster Session I
Skudra, Justine	Lunch & Poster Session II Presenter
Smeets, Paul	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice
Smidts, Ale	Lunch & Poster Session I
Smits, Jasper	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
Snoek, Lukas	Lunch & Poster Session II
Soares Brandão, Daniel	Lunch & Poster Session II
Solodunova, Maria	Lunch & Poster Session I
Songco, Annabel	Lunch & Poster Session I Presenter
Southgate, Victoria	SYMPOSIUM - Interactive brains: neural mechanisms of two-person social interaction
Soutschek, Alexander	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice Presenter SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach
Spape, Michiel Marten	Social decision making Presenter
Speer, Sebastian P. H.	Social decision making Presenter
Spencer, Hannah	Social cognition I
Spooren, Will	SYMPOSIUM - Heterogeneity in autism spectrum disorders
Sprengeler, Mona Katharina	Lunch & Poster Session II
Steenbergen, Laura	SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential ESCAN young researcher award lectures Presenter
Steiger-White, Frauke	Lunch & Poster Session I
Steinberg, Christian	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation
Stephanou, Georgia	Social cognition II Presenter Lunch & Poster Session I Presenter
Sterling, Grigoriy	Lunch & Poster Session I
Stock, Ann-Kathrin	Lunch & Poster Session I Lunch & Poster Session II Lunch & Poster Session II Lunch & Poster Session I Lunch & Poster Session I Presenter Lunch & Poster Session II Presenter Lunch & Poster Session II
Stoop, Ron	Lunch & Poster Session I
Stout, Daniel	SYMPOSIUM - A failure to filter threat?: How bottom-up and top-down control processes contribute to the expression and regulation of fear and anxiety
Straube, Thomas	SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation
Stürmer, Birgit	Lunch & Poster Session II
Su, Peter	Empathy
Suddendorf, Thomas	Decision making
Sugiura, Ayaka	Lunch & Poster Session II
Sui, Jie	The self
Summerer, Lena	Lunch & Poster Session II Lunch & Poster Session I
Sundström-Poromaa, Inger	Lunch & Poster Session II Lunch & Poster Session II

Author(s)	Session
Suran, Tiziano	Social representation Presenter
Szabo, Edina	Lunch & Poster Session II
Szabó, Edina	Lunch & Poster Session II Lunch & Poster Session I Presenter
Szabó, Ádám György	Lunch & Poster Session I
Szczepanik, Michał	Lunch & Poster Session I
Takács, Ádám	Lunch & Poster Session II
Tas, Cumhur	Lunch & Poster Session I
Tendolkar, Indira	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
Terburg, David	Perception and emotion Presenter Lunch & Poster Session I
Terenzi, Damiano	Lunch & Poster Session II Presenter
Thayer, Julian F.	SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential
Tholen, Matthias	Empathy
Tidoni, Emmanuele	Lunch & Poster Session II
Tieri, Gaetano	Lunch & Poster Session I
Tiihonen, Marianne	Lunch & Poster Session I Presenter
Tik, Martin	SYMPOSIUM - The Balance between You and Me: Integrating social, affective and embodied approaches to the self-other distinction SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Tikhomirova, Tatiana	Lunch & Poster Session I Presenter
Tillmann, Julian	SYMPOSIUM - Heterogeneity in autism spectrum disorders Presenter
Ting, Kin-hung	Lunch & Poster Session I
Tobler, Philippe	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach Presenter SYMPOSIUM - Reinforcement learning in a social world
Torriero, Sara	Attention Presenter
Tost, Heike	SYMPOSIUM - Heterogeneity in autism spectrum disorders
Tracey, Irene	SYMPOSIUM - How motivational and learning processes shape pain and avoidance
Trujillo, Laura	Lunch & Poster Session I
Trusbak Haumann, Niels	Lunch & Poster Session I
Trutti, Anne Charlotte	Lunch & Poster Session II Presenter SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off
Truzzi, Anna	Empathy
Tsakiris, Manos	SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential SYMPOSIUM - The social brain in context: How we (dis)engage with socio-political issues Presenter SYMPOSIUM - Putting interoception at the heart of social cognition: Addressing methodological, conceptual and research challenges Presenter Lunch & Poster Session II Lunch & Poster Session I Lunch & Poster Session II
Tschernegg, Melanie	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Tse, Wai S.	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation Presenter
Turkileri, Nilgun	Perception and emotion Presenter
Twomey, Katherine	SYMPOSIUM - From social cognitive neuroscience to robotics and back – what can we learn from bidirectional links between these disciplines Presenter
Tymorek, Agnieszka Dominika	Lunch & Poster Session I Presenter
Ueno, Taiji	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
Umiltà, Maria Alessandra	Face perception
Uusberg, Andero	Lunch & Poster Session I Lunch & Poster Session II Presenter
Vaes, Jeroen	Lunch & Poster Session I

Author(s)	Session
Vahid, Amirali	Lunch & Poster Session II Lunch & Poster Session II Lunch & Poster Session II Presenter
Valt, Christian	Lunch & Poster Session II Presenter
Van Diest, Ilse	SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential Lunch & Poster Session II
Van Dillen, Lotte	Social cognition I
Van Overwalle, Frank	SYMPOSIUM - The Social Cerebellum: New insights and evidence Presenter Social representation Social representation
Van de Vliet, Laura	SYMPOSIUM - You only know when it's gone: neural (network) and behavioral effects of amygdalar lesions Presenter
Van den Stock, Jan	SYMPOSIUM - You only know when it's gone: neural (network) and behavioral effects of amygdalar lesions
Vanags, Edmunds	Lunch & Poster Session II Lunch & Poster Session II
Vandenbulcke, Mathieu	SYMPOSIUM - You only know when it's gone: neural (network) and behavioral effects of amygdalar lesions
Vanicek, Thomas	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Vanman, Eric John	SYMPOSIUM - In memory of John T. Cacioppo Presenter
Vantrepotte, Quentin	Lunch & Poster Session II
Vanutelli, Maria Elide	Lunch & Poster Session II
Varga, Vera	Lunch & Poster Session I Presenter
Vassena, Eliana	Decision making Presenter
Vecchi, Tomaso	SYMPOSIUM - The Social Cerebellum: New insights and evidence
Veldhuizen, Maria Geraldine	SYMPOSIUM - Recent developments in the neuropsychology of flavor processing Presenter
Ventura-Bort, Carlos	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential Lunch & Poster Session II Presenter
Verbeke, Willem	SYMPOSIUM - The social neuroscience of human attachment
Verduyn, Philippe Verduyn	Lunch & Poster Session I
Vergallito, Alessandra	Social decision making
Vergari, Ilaria	SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off
Verkuil, Bart	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential
Vilarem, Emma	Lunch & Poster Session I Social cognition I SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control
Villringer, Arno	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice
Vlaeyen, Johan	SYMPOSIUM - How motivational and learning processes shape pain and avoidance Presenter
Von Gunten, Armin	Lunch & Poster Session I
Vorobeva, Viktoriia	Agency
Vrijsen, Janna Nonja	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions Presenter
Vrticka, Pascal	SYMPOSIUM - The social neuroscience of human attachment SYMPOSIUM - The social neuroscience of human attachment Presenter
Vu, Tuong Van	Lunch & Poster Session II Presenter
Vuilleumier, Patrik	Lunch & Poster Session I
Wager, Tor D.	SYMPOSIUM - How motivational and learning processes shape pain and avoidance
Walentowska, Wioleta	SYMPOSIUM - Affective influences on cognitive control: Psychological processes
Walentowska, Wioleta	Lunch & Poster Session II Presenter

Author(s)	Session
Walsh, Emilie	Lunch & Poster Session I
Walter, Martin	SYMPOSIUM - The social neuroscience of human attachment
Wan, Lu	Lunch & Poster Session I
Ward, Jamie	Lunch & Poster Session I
Warreyn, Petra	Autism
Wascher, Edmund	Lunch & Poster Session I Attention
Watzl, Carsten	Attention
Weber, Hannelore	Emotion regulation
Weeda, Wouter	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation
Weiss, Elisabeth M.	Emotion regulation Lunch & Poster Session I
Weisz, Nathan	Lunch & Poster Session II Lunch & Poster Session I
Wendt, Julia	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential Lunch & Poster Session II
Wessing, Ida	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation Presenter
West, Tessa	Lunch & Poster Session I
Westbrook, Andrew	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice Presenter
Weymar, Mathias	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions Presenter SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential Presenter Lunch & Poster Session II Lunch & Poster Session II
White, Lars O.	SYMPOSIUM - The social neuroscience of human attachment Presenter
Wicking, Manon	Lunch & Poster Session I
Wiebking, Christine	Lunch & Poster Session I Presenter
Wiers, Reinout W.	Lunch & Poster Session I
Wiersema, Jan Roel	Autism
Wierzba, Małgorzata	Memory Lunch & Poster Session I
Wieser, Matthias J	SYMPOSIUM - A failure to filter threat?: How bottom-up and top-down control processes contribute to the expression and regulation of fear and anxiety Presenter
Wiest, Roland	Lunch & Poster Session II
Wilhelm, Frank	Lunch & Poster Session I
Willeit, Matthäus	SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach
Willemse, Cesco	Social attention Presenter
Williams, Christian	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
Williams, Justin	Decision making Autism
Williams, Walter Craig	Lunch & Poster Session II
Wilson, Richard	SYMPOSIUM - The social brain in context: How we (dis)engage with socio-political issues
Windischberger, Christian	SYMPOSIUM - The Balance between You and Me: Integrating social, affective and embodied approaches to the self-other distinction SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Winkelmann, Tobias	Lunch & Poster Session I
Winker, Constantin	SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation

Author(s)	Session
Wirkner, Janine	SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential Lunch & Poster Session II
Witcraft, Sara	SYMPOSIUM - Current research and emerging directions in emotional memory: Evidence from healthy functioning, psychopathology, and interventions
Wittmann, Marco	SYMPOSIUM - Reinforcement learning in a social world
Wlodek, Jakub	Lunch & Poster Session I
Woletz, Michael	SYMPOSIUM - Deficits in empathy and prosociality? The influence of aging and clinical conditions on socio-affective processing
Wolff, Nicole	Lunch & Poster Session II Lunch & Poster Session I
Wolters, Carsten	SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation
Woodcock, Kate	Lunch & Poster Session II
Wormwood, Jolie B.	SYMPOSIUM - Predictive processing approaches in affective neuroscience
Wu, Taoyu	Lunch & Poster Session II
Wu, Xinhuai	Lunch & Poster Session II
Wu, Yin	SYMPOSIUM - Social motivation and reward: A multi-level, multi method approach
Wyart, Valentin	Perception and emotion
Wykowska, Agnieszka	Agency Social attention SYMPOSIUM - From social cognitive neuroscience to robotics and back – what can we learn from bidirectional links between these disciplines Presenter Social attention
Wypych, Marek	Memory Lunch & Poster Session I
Wytykowska, Agata	Lunch & Poster Session II Presenter Cognitive control Presenter
Yomogida, Yukihito	Lunch & Poster Session II
Zaki, Jamil	Lunch & Poster Session II
Zangoli, MariaGrazia	Lunch & Poster Session I
Zanon, Marco	Lunch & Poster Session I
Zhang, Qian	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation
Zhang, Rui	Lunch & Poster Session II
Zhang, Wei	SYMPOSIUM - Emotion and action: reflexes, motivational goals and motor control
Zhao, Yili	Lunch & Poster Session II Presenter
Zhou, Shuai	Lunch & Poster Session II
Zia, Ayesha	Psychopathology Presenter
Zidda, Francesca	Lunch & Poster Session I
Ziereis, Annika Carina	Lunch & Poster Session I Presenter
Zink, Nicolas	Lunch & Poster Session I Presenter Lunch & Poster Session II Presenter
Zsombók, Terézia	Lunch & Poster Session I
Zwanzger, Peter	SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation
Zwitserlood, Pienie	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation SYMPOSIUM - Biased emotion processing in affective disorders – Influences of learning experience, context information, and brain stimulation
de Bruijn, Ellen	The self
de Gelder, Beatrice	SYMPOSIUM - You only know when it's gone: neural (network) and behavioral effects of amygdalar lesions Presenter
de Jong, Joost	Lunch & Poster Session II Presenter
de Klerk, Carina	SYMPOSIUM - Interactive brains: neural mechanisms of two-person social interaction Presenter
de Lima Araujo, Geissy Lainny	Lunch & Poster Session II Presenter Lunch & Poster Session I Presenter
di Pellegrino, Giuseppe	SYMPOSIUM - Heterogeneity in autism spectrum disorders SYMPOSIUM - Heterogeneity in autism spectrum disorders Lunch & Poster Session II
te Koppele, Jurriaan	Lunch & Poster Session II
van Dillen, Lotte F.	SYMPOSIUM - Recent developments in the neuropsychology of flavor processing Presenter

Author(s)	Session
van Dongen, Josanne D. M.	Empathy Presenter
van Dooren, Roel	SYMPOSIUM - Behavioral, methodological, and neuromodulatory approaches to cognitive control: the flexibility versus persistence trade-off Presenter
van Dun, Kim	SYMPOSIUM - The Social Cerebellum: New insights and evidence Presenter
van Honk, Jack	Lunch & Poster Session I
van Reekum, Carien M	SYMPOSIUM - A failure to filter threat?: How bottom-up and top-down control processes contribute to the expression and regulation of fear and anxiety Presenter SYMPOSIUM - In memory of John T. Cacioppo Presenter
van Rijn, Hedderik	Lunch & Poster Session II
van Steenbergen, Henk	SYMPOSIUM - Recent developments in the neuropsychology of flavor processing SYMPOSIUM - Affective influences on cognitive control: Psychological processes Presenter
van Voskuilen, Brandon	Lunch & Poster Session I
van den Wildenberg, Wery P.M.	Lunch & Poster Session I
van der Does, Willem	SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential SYMPOSIUM - The cognitive function of the vagus nerve: From neural mechanisms to clinical potential
van der Meulen, Anna	Lunch & Poster Session II
van der Molen, Melle J.W.	SYMPOSIUM - Socio-affective influences on stimulus perception and memory formation Presenter
van der laan, Nynke	SYMPOSIUM - Self-control beyond impulse inhibition: Neural mechanisms of self-control and their contribution to dietary choice Presenter
von Klitzing, Kai	SYMPOSIUM - The social neuroscience of human attachment
von Leupoldt, Andreas	SYMPOSIUM - A failure to filter threat?: How bottom-up and top-down control processes contribute to the expression and regulation of fear and anxiety
Yang, Wenting	Decision making Presenter