

The background of the entire page is a scenic photograph of Lake Geneva in Switzerland. A tall, thin fountain jet is visible in the middle ground, with a cityscape and mountains in the distance under a cloudy sky. The sun is low on the horizon, creating a warm glow.

21st World Congress of Psychophysiology



June 26-29, 2023, Geneva, Switzerland
www.iop2023.com

PROGRAM

WELCOME ADDRESS

Welcome to Geneva!

It is a great honor to host IOP2023 – the 21st World Congress of Psychophysiology of the International Organization of Psychophysiology (IOP), at the University of Geneva, Switzerland. This is the first in presence conference of IOP since the 2018 congress in Lucca, Italy. Due to the COVID19 pandemic, the last IOP congress that was organized by the University of Chengdu, China had to be held as an online conference. That congress was a great success, but in presence conferences give our research communications the special social human touch that is vital for the exchange and the discussion of research. We are happy that this is again possible and to host this special event at the University of Geneva.

Switzerland, and especially Geneva, are hotspots for research in psychophysiology and neuroscience. The University of Geneva and Lake Geneva area host many internationally profiled laboratories and research centers that are specialized in studying the interaction between the mind and the body. Geneva is a picturesque and vital international city located between the Alps and the Jura mountains at Lake Geneva in the heart of Europe. It is easily accessible and specialized in hosting international conferences and will provide a unique location for a productive and enjoyable meeting.

IOP2023 is a very international scientific conference. We can welcome more than 360 attendants coming from 34 different countries. Beside the presidential address and six invited keynote lectures, IOP2023 hosts 38 symposia, two poster sessions, and as a new format nine single talk sessions, presenting recent innovative findings in psychophysiology and neuroscience. The program with its 400 scientific presentations and social events is very rich and divers and reaches from fundamental to applied research covering basic studies on the role of the nervous system in psychological processes to research on pathologies.

Organizing international scientific conferences in the aftermath of the COVID19 pandemic and the actual global political situation is a challenge with multiple logistic and financial risks. Thus, we are especially grateful to the University of Geneva, the State of Geneva, and the many scientific funding organizations who have provided logistical and financial help for letting IOP2023 take place. All sponsors are gratefully listed in this conference program.

The whole Local Organizing Committee is deeply honored to welcome you. We look forward to your participation and involvement and thank you for your scientific contributions.

Guido H.E. Gendolla

Congress Chair, IOP2023 – the 21st World Congress of Psychophysiology.

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Address:

Boulevard du Pont-d'Arve 40,
1205 Genève

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- **Tram 15** (direction Grand-Lancy, Place du 1^{er} août) to Uni Mail – 10 minutes
- **Tram 18** (direction Grand Lancy, Pontet) to Pont-d'Arve – 14 minutes
- **Bus 1** (direction Thônex, Hôpital Trois-Chêne) to Pont-d'Arve – 14 minutes
- Taxi to Uni Mail – 7 minutes

Access from the airport:

- **Bus T72** (direction Annecy, Gare routière) to Lancy Pont Rouge, Gare/Etoile and **tram 17** (direction Annemasse-Parc Montessuit) to Uni Mail – 22 minutes
- **Bus 10** (direction Genève, Rive) to Cornavin and **tram 15** (direction Grand-Lancy, Place du 1^{er} août) to Uni Mail – 30 minutes
- **Bus 23** (direction Carouge GE, Tours) to Grand-Lancy and **tram 15** (direction Genève, Nations) to Uni Mail – 33 minutes
- **Gare d'aéroport to Geneva Cornavin station and tram 15** (direction Grand-Lancy, Place du 1^{er} août) to Uni Mail – 20 minutes

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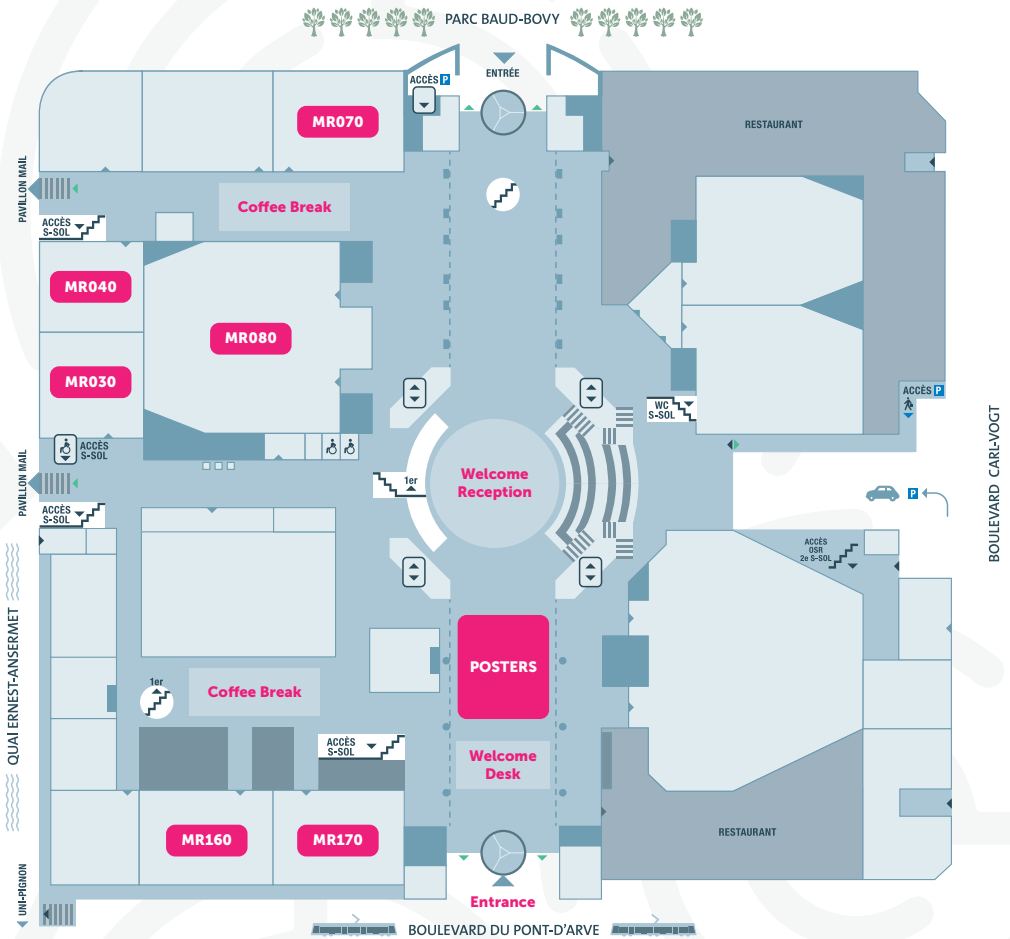
Cloakroom

There is no baggage room in the University building, but you can leave your baggage in the back of the conference rooms on the day of your arrival / departure, if needed.

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- A. If your home institution is part of the international Eduroam project, we recommend you connect to the wifi via **Eduroam**. This is a secured network. 
- B. If your home institution is not part of the international Eduroam project, you can connect to the **guest wifi** of the University of Geneva. This is an unsecured network. Please follow the following steps:
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 2. Make sure your browser accepts pop-up windows and javascript to run.
 3. In your browser make a HTTP / HTTPS request to any URL (e.g., www.unige.ch).
 4. Your request will be intercepted, and you will be directed to an e-portal where you can register and authenticate.
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 7. You will receive a code via SMS, which you need to enter on the next screen and click the «Login» button.
 8. If your code is accepted, you will be automatically redirected to the e-University website.
 9. Your access code is valid for 6 months, during which you will not need to request a new code.

PLAN OF THE BUILDING



PROGRAM OVERVIEW

Monday, June 26th

10:45 - 18:00	Registration
14:00 - 14:30 <i>MR080</i>	Opening ceremony
14:30 - 15:30 <i>MR080</i>	Presidential address: «Neurophysiological signature of clinical subtypes of development dyslexia» Giuseppe Chiarenza
15:30 - 16:00	Coffee break
16:00 - 18:00 <i>MR030</i>	Symposium - Recent Advances in Neuroimage and Modulation for Psychiatric disorders (C. Luo, China)
16:00 - 18:00 <i>MR040</i>	Symposium - The psychophysiology of effort: cardiovascular and pupillary correlates of effortful processing (M. Richter, United Kingdom & G. H.E. Gendolla, Switzerland)
16:00 - 18:00 <i>MR160</i>	Symposium: Pink and white noise in the EEG (R. J. Barry & F. De Blasio, Australia)
16:00 - 18:00 <i>MR170</i>	Symposium: Psychophysiological mechanisms of memory modulation by emotion (M. Riegel ; U. Rimmel, Switzerland & K. Mickley-Steinmetz, USA)
18:00 - 19:00	Poster Session 1
18:00 - 20:00	Welcome reception

Tuesday, June 27th

09:00 - 18:00	Registration
09:00 - 10:30 <i>MR030</i>	Symposium - Feedback, Biofeedback and Neurofeedback for motor control training (O. M. Bazanova, Russian Federation & R. Pozzo, Italy)
09:00 - 10:30 <i>MR040</i>	Single Talks I Chair: K. Brinkmann A. Zuberer (122), M. Nanni Zepeda (132), E. Orekhova (128), S. Frühholz (144)

09:00 - 10:30 <i>MR160</i>	Symposium - Error-signalling and expecting the unexpected. (J. Todd, Australia)
09:00 - 10:30 <i>MR170</i>	Symposium - New advancements in the neuroscience of personality and individual differences (V. De Pascalis, Italy & J. Ciorciari, Australia & P. Gable, USA)
09:00 - 10:30 <i>MR070</i>	Symposium - The sensory-deprived brain as a unique tool to understand brain development and function (S. Casarotto & E. Ricciardi, Italy)
10:30 - 11:00	Coffee break
11:00 - 12:00 <i>MR080</i>	Keynote session: « Affectivism and the emotional brain » David Sander
12:00 - 13:00	Lunch break
13:00 - 14:30 <i>MR030</i>	Single Talks II Chair: M.N. Jarczok T. Navoenko (33), M. N. Jarczok (129), E. Mikhailets (53), D. Mathersul (49)
13:00 - 14:30 <i>MR040</i>	Single Talks III Chair: D. Framorando A. Areces-Gonzalez (42), S. Hu (188/202), Y. Wang (196)
13:00 - 14:30 <i>MR160</i>	Symposium - Neurocognitive and psychophysiological mechanisms behind stress anticipation and their role in stress regulation (R. De Raedt & M. Pulopulos, Belgium, G. Miknevičute, Switzerland)
13:00 - 14:30 <i>MR170</i>	Symposium - Voice and emotions: insights into psychophysiological modulation during development (D. Grandjean & M. Filippa, Switzerland)
13:00 - 14:30 <i>MR070</i>	Symposium - Frequency principal components analysis (fPCA) of resting EEG: clinical applications (G. Steiner-Lim & F. De Blasio, Australia)
14:30 - 15:30 <i>MR080</i>	Keynote session: « Psychobiology of physical activity behavior: Ultimate and proximate causes » Samuele M. Marcora
15:30 - 16:00	Coffee break
16:00 - 18:00 <i>MR030</i>	Symposium - Recent advances in the psychophysiology of effort I: Compensatory processes and self-control (J. Falk, Switzerland)

16:00 - 18:30 <i>MR040</i>	Single Talks IV Chair: J. Kaiser X. Wang (96), S. Szekely (152), Q. Meteier (66), M. Xue Tan (125), E. Lyakso (107), G. Blais (74), J. Kaiser (111)
16:00 - 18:00 <i>MR160</i>	Symposium - Thalamic and primary visual cortex contributions to early visual processing revealed by the N40 and C1 ERP components (G. Pourtois, Belgium)
16:00 - 18:00 <i>MR170</i>	Symposium - New adventures in embodied cognition: the role of sensorimotor integration in the experience and perception of affect (L. Ceravolo, Switzerland)
16:00 - 18:00 <i>MR070</i>	Symposium - The Global Brain Symposium EEG project (P. A. Valdes-Sosa, China & Y. Pavlov, Germany)
18:00 - 19:00 <i>MR160</i>	Symposium - Event-related potential studies relating to brain microstates, intelligence, and rehabilitation. (T. F Collura, USA & T. Feiner, Germany)
19:00 - 20:30	Social Reception

Wednesday, June 28th

09:00 - 18:00	Registration
09:00 - 10:30 <i>MR030</i>	Symposium - Using psychophysiological methods to understand and enhance the safety of human mobility (F. Mazeris & A. Bequet, France)
09:00 - 10:30 <i>MR040</i>	Single Talks V Chair: L. Feldmann C. Zsigo (46), S. Hu (200), L. Feldmann (76), A. Szekely (148)
09:00 - 10:30 <i>MR160</i>	Symposium - The role of attention in the development of speech perception (V. L. Shafer, USA)
09:00 - 10:30 <i>MR170</i>	Symposium - From Early Life Adversities to adverse health outcomes: A translational precision-based approach (C. Ottaviani, Italy)
10:30 - 11:00	Coffee break
11:00 - 12:00 <i>MR080</i>	Keynote session: «The locus coeruleus in aging» Mara Mather

12:00 - 13:00	Lunch break
13:00 - 14:30 <i>MR030</i>	Single Talks VI Chair: H. Nittono F. Álvarez (154), C. Nussbaum (55), H. Nittono (47), L. Ficco (71)
13:00 - 14:30 <i>MR040</i>	Single Talks VII Chair: C.M. Gómez S. Leimroth (65), A. González Mitjans (194), A. Kovalev (140), C. M. Gómez (204)
13:00 - 14:30 <i>MR160</i>	Symposium - Psychophysiology of Aggression (J. Armony, Canada)
13:00 - 14:30 <i>MR170</i>	Symposium - Psychophysiological markers of acute mental fatigue (M. Audiffren & N. André, France)
14:30 - 15:30 <i>MR080</i>	Keynote session: «Two sides of the same coin? How the intersections of pain and reward affect perception and behavior in healthy state and in disease» Susanne Becker
15:30 - 16:00	Coffee break
16:00 - 18:00 <i>MR030</i>	Symposium - Advances in the psychophysiology of affective learning and decision-making (Y. Stussi & E. R. Pool, Switzerland)
16:00 - 18:00 <i>MR040</i>	Symposium - Brain-Apparatus Conversation (S. Ferraro, China)
16:00 - 18:00 <i>MR160</i>	Symposium - Influences of in vivo and ex vivo forces on cognitive control functions (M. J. Larson & P. E. Clayson, USA)
16:00 - 18:00 <i>MR170</i>	Symposium - Recent advances in the psychophysiology of effort II: The role of motor command, running styles, alertness, and social processes (D. Framorando, Switzerland)
16:00 - 18:00 <i>MR070</i>	Symposium - Erol Basar's legacy 5 years from his last travel: EEG biomarkers of vigilance and cognitive disorders (B. Güntekin, Turkey & C. Babiloni, Italy)
18:00 - 19:00	Poster Session 2
19:30 - 22:30	Conference dinner, Brasserie des Halles de l'Ile

Thursday, June 29th

09:00 - 18:00	Registration
09:00 - 10:30 <i>MR030</i>	Symposium - Female neuropsychological traits across the menstrual cycle (O. M. Bazanova, Russian Federation & R. Zhou, China)
09:00 - 10:30 <i>MR040</i>	Single Talks VIII Chair: C. Scarpini E. Ort (149), M. I. Froböse (163), A. Razorenova (138), C. Scarpini (175)
09:00 - 10:30 <i>MR160</i>	Symposium - Psychophysiological approaches to emotion regulation and psychopathology: Shedding light on strategies to improve mental health (C. Webster & E. Kross, USA)
09:00 - 10:30 <i>MR170</i>	Symposium - Applications of the qEEG in psychiatric and neurodevelopmental disorders (J. Bosch-Bayard, Canada & M. L. Bringas-Vega, China)
10:30 - 11:00	Coffee break
11:00 - 12:00 <i>MR080</i>	Keynote session: «Origins and consequences of mood flexibility» Mathias Pessiglione
12:00 - 13:00	Lunch break
13:00 - 14:30 <i>MR030</i>	Symposium - Technology assisted psychophysiology intervention (J. Zhao ; D. Zhu & C. Zhang, China)
13:00 - 14:30 <i>MR040</i>	Single Talks IX Chair: S. Fischer S. Naik (195), C. Lopez Naranjo (193), S. Fischer (52)
13:00 - 14:30 <i>MR160</i>	Symposium - Psychophysiological correlates of shades of psychopathy (H. Eisenbarth, New Zealand)
13:00 - 14:30 <i>MR170</i>	Symposium - Measurement of ERPs during real-life activities (M. Kimura & H. Nittono, Japan)
14:30 - 15:30 <i>MR080</i>	Keynote session: «The psychophysiology of mental effort» Michael Richter
15:30 - 16:00	Coffee break

16:00 - 18:00 <i>MR030</i>	Symposium - Visual Brain: The Role of EEG Alpha Rhythm in Perception, Attention and Vigilance (A. Zani ; S. Lopez, Italy & D. Pascucci, Switzerland)
16:00 - 18:00 <i>MR040</i>	Symposium - Experiential and physiological consequences of social presence and interaction setting (E. Dan-Glauser, Switzerland)
16:00 - 18:00 <i>MR160</i>	Symposium - Connecting mind and body with biofeedback: innovative and rigorous approaches to cognitive enhancement (L. Bögge ; S. Chikhi & S. Blanchet, France)
16:00 - 18:00 <i>MR170</i>	Symposium - Psychophysiology of interoception: new methodological approaches (E. Georgiou, Germany)
18:00 - 19:00 <i>MR080</i>	Closing ceremony

PRESIDENTIAL ADDRESS

Presidential Address: Giuseppe A. Chiarenza

NEUROPHYSIOLOGICAL SIGNATURES OF CLINICAL SUBTYPES OF DEVELOPMENTAL DYSLEXIA

G.A. Chiarenza (International Center for Learning, Attention, and Hyperactivity Disorders, Milan, Italy)

The story of my final address as president of the IOP begins in 1973, when Elena Boder, a pediatric neurologist at the University of California, Los Angeles, published a test to identify dyslexia subtypes in the journal *Developmental Medicine and Child Neurology*. According to Boder's model, reading and spelling are represented in widely distributed neural networks that are interactive and overlapping. This model described reading as a two-channel function that required the perfect dynamic interplay of intact visual-gestalt and analytic-auditory functions, as well as the integration of both peripheral and central processes. The normal dynamic network interplay of Gestalt and analytic-synthetic processes is disassociated with dyslexic children. The dyslexic child reads and spells differently from normal readers, both qualitatively and quantitatively. Consequently, from the analysis of reading and writing errors, Boder described three main subtypes of dyslexia: dysphonetic (DD), dyseidetic (DYD), and mixed (MD), plus a fourth group defined as reading retardation. These subtypes have also been described in Italian mother-tongue subjects. The research conducted in recent years has been to verify the hypothesis that the disruption of the dynamic network interplay of gestalt and analytic synthetic processes could have a neurophysiological, not only clinical, pattern. With the new Harmonized Multinational qEEG Norms, which introduced the norms for the full cross-spectra matrices (doi: 10.1016/j.neuroimage.2022.119190), we applied an EEG stable and sparse regression classifier, using the complex numbers of the cross-spectra z scores. We found that the best classifiers were in the off-diagonal elements of the cross-spectral matrices, i.e., the main differences among the groups are related to the information flow among different areas of the brain rather than in the log-spectra. Using this method, we dramatically improved the classification power of the EEG to differentiate the different dyslexia subtypes. The areas under the ROC were DDvsDYD = 0.85, DDvsMD = 0.94, and DYDvsMD = 0.78. The control group was completely separated from the dyslexic subtypes. Furthermore, the number of variables required for classification was significantly reduced. A plot of the real part vs. the imaginary part of the Z-scores for each group and each classifier showed a more similar distribution for the dysphonetics and mixed than for the dyseidetics. This is consistent with the clinical evidence that the mixed group is the most severe type of dysphonetics with the lowest reading quotients. Our results are a neurophysiological corroboration of Boder's model that dysphonetics and dyseidetics have different dysfunctions in the reading and spelling of cerebral networks.

INVITED LECTURES

Invited Lecture: Susanne Becker

TWO SIDES OF THE SAME COIN? HOW THE INTERSECTIONS OF PAIN AND REWARD AFFECT PERCEPTION AND BEHAVIOR IN HEALTHY STATE AND IN DISEASE

S. Becker (Heinrich Heine University Düsseldorf, Germany)

We hate pain and we love reward. What happens if pain and reward are present at the same time? This creates a motivational conflict. By weighting costs and benefits, avoidance/escape of pain or approach of reward has to be prioritized. This weighting is not a purely cognitive process. Rather conflicting motivations lead to a top-down modulation of perception. For example, if an individual decides to approach a reward at the cost of receiving pain, endogenously mediate pain inhibition occurs. In contrast, the decision to avoid/escape the pain at the cost of not gaining the reward, results in endogenous pain facilitation. Such perceptual effects foster optimal decision-making depending on the external situation and internal factors such as the homeostatic state. Based on such intersections and known overlaps in underlying brain mechanisms, it has been discussed whether pain and reward are the two sides of the same coin or the two ends of a hedonic continuum with emotion and motivation as the common currency. Importantly, it has also been suggested that alterations in such pain-reward intersections contribute to the development and maintenance of chronic pain and an often-observed associated negative hedonic shift. Despite these assumptions, surprisingly little is known about the precise psychobiological mechanisms of pain-reward intersections in healthy states and in disease. I will present here data that illustrates the complexity of such intersections. Depending on the motivational state of an individual, but also on novelty seeking as a personality trait, endogenous pain modulation by reward varies largely. Further, different components of pain perception, namely sensory-discriminative and emotional-motivational components, can be differentially modulated by reward and thereby dissociated, providing a model for the assumed negative hedonic shift in chronic pain. Interestingly, reward-induced pain modulation is associated with prediction errors, which are an important learning signal. Further, we showed that the neurotransmitter dopamine mediates reward-induced pain modulation. Specifically, the association with prediction errors is dependent on dopamine and in Parkinson's disease dopamine restores the capability for reward-induced pain modulation. Focusing on underlying brain networks, the medial prefrontal cortex appears to be crucial in pain-reward intersections. Particularly, the orbitofrontal cortex mediates the variability in reward-induced pain inhibition and the perigenual anterior cingulate cortex (pgACC) prediction errors related to such pain modulation. Interestingly, activation in this pgACC related to prediction errors is reduced in chronic pain. Further evidence on altered pain-reward intersections and their potential pathogenetic role in chronic pain will be discussed.

Invited Lecture: Samuele Marcora

PSYCHOBIOLOGY OF PHYSICAL ACTIVITY BEHAVIOUR: ULTIMATE AND PROXIMATE CAUSES

S. Marcora (University of Bologna, Italy)

Physical inactivity is associated with coronary heart disease, obesity and type 2 diabetes, disability and neurodegeneration in old age, the most common cancers, and poor mental health. Yet most adults in industrialised societies are physically inactive. To fully understand the avoidance of physical activity, as for any other behaviour, we need to understand its fitness consequences (ultimate causes) and its mechanisms (proximate causes). With regard to the ultimate causes, it is essential to understand the complex role of physical activity in the regulation of energy homeostasis in the environment in which *Homo Sapiens* evolved. On the one hand, moderate-to-vigorous physical activity (MVPA) was essential for energy intake through hunting and gathering. On the other hand, such mandatory MVPA required a significant amount of energy (e.g. 1800 kcal for a persistence hunt). In comparison to our current food environment, energy availability in Sub-Saharan Africa 300,000 years ago was very limited. Therefore, engaging extensively in MVPA above and beyond hunting and gathering would have led to a state of energy deficiency. Energy deficiency causes impairments in physical and cognitive performance, poor immune response, amenorrhoea/oligomenorrhoea (in women), osteopenia, low body fat and, thus, reduced chances of survival and reproduction. It is therefore not surprising that evolution selected humans that avoided unnecessary physical exertion. As for mechanisms, we propose that the avoidance of unnecessary physical exertion is determined by the interaction of two main psychological factors: perceived effort and potential motivation. Perceived effort refers to the subjective feelings of effort experienced during physical activity whilst potential motivation is the highest effort one is willing to exert in order to satisfy a motive. Because of the generally aversive nature of perceived effort, humans engage in MVPA only when the effort required is justified (for example to reduce hunger or, in modern times, achieve goals like completing a marathon). Perceived effort is well suited for its contribution to the regulation of energy homeostasis because it increases with both the intensity and the duration of physical activity, the two main factors determining activity-related energy expenditure (AEE). However, several lines of evidence suggest that perceived effort is not generated by processing afferent signals related to AEE. Instead, perceived effort reflects signals related to the motor commands that normally result in voluntary muscle contractions and, thus, the expenditure of biological energy. The practical applications of this psychobiological model to facilitate physical activity behaviour will be discussed.

Invited Lecture: Mara Mather

THE LOCUS COERULEUS IN AGING

M. Mather (University of Southern California, Los Angeles, United States)

The locus coeruleus (LC) is a small brainstem nucleus that provides most of the brain's noradrenaline. As the brain's hub region for arousal, it integrates signals about wakeful, autonomic, and emotional arousal and coordinates brain activity to support the current arousal state. Our GANE model posits that, due to its interactions with local cortical excitatory activity, noradrenaline released under arousal can flexibly enhance processing of representations that currently have high priority. The LC's role in aging is of particular interest because, before any other Alzheimer's-related pathology can be detected in the cortex, initial indications of tau pathology appear in the locus coeruleus and slowly spread along its axons. Tau tangles appear in the initial cortical targets of the LC (medial temporal cortex and hippocampus) before other regions. More generally throughout the brain, release of noradrenaline can either promote or suppress the production and accumulation of amyloid- β and tau. Thus, LC function is likely to influence the rate of Alzheimer's disease progression. Evidence suggests that stress-induced high tonic levels of LC activity accelerate Alzheimer's disease while the phasic burst pattern of LC activity seen under conditions of novelty is protective. In a recent clinical trial, we used 5 weeks of daily slow paced breathing during heart rate variability biofeedback to reduce noradrenergic activity and increase parasympathetic activity, compared to an active comparison condition. Differential changes across the two conditions in LC structure and the volume of hippocampal subregions targeted by the LC suggest that this intervention affects the LC in ways that promote healthy brain aging.

Invited Lecture: Mathias Pessiglione

ORIGINS AND CONSEQUENCES OF MOOD FLEXIBILITY

M. Pessiglione (Paris Brain Institute, Pitié-Salpêtrière Hospital, France)

A stable and neutral mood (euthymia) is commended by both economic and clinical perspectives, because it enables rational decisions and avoids mental illnesses. Here we suggest, on the contrary, that a flexible mood responsive to life events may be more adaptive for natural selection, because it can help adjust the behavior to fluctuations in the environment. In our model (dubbed MAGNETO), mood represents a global expected value that biases decisions to forage for a particular reward. When flexible, mood is updated every time an action is taken, by aggregating incurred costs and obtained rewards. Model simulations show that, across a large range of parameters, agents with flexible mood outperform cold agents (with stable neutral mood), particularly when rewards and costs are correlated in time, as naturally occurring across seasons. However, with more extreme parameters, simulations generate short manic episodes marked by incessant foraging and lasting depressive episodes marked by total inaction. The model therefore accounts for both the function of mood fluctuations and the emergence of mood disorders. We tested the predictions of this model, using established mood induction paradigms combined with independent economic choices

that opposed small but uncostly rewards to larger but costly rewards (involving either risk, delay or effort). Mood fluctuations were induced either by positive versus negative feedback given to participants answering quiz questions (n=102) or by sad versus happy short texts associated with congruent music (n=94) participants across four studies. In both cases, we found that during episodes of positive mood (relative to negative mood), choices were biased towards large-but-costly (versus uncostly-but-small) rewards, irrespective of the cost type. The choice bias was not only related to self-reported mood (ratings on a visual analog scale), but also to a notion of mood reconstructed from physiological measures of autonomic arousal (pupil size and skin conductance) and affective valence (contraction of smiling versus frowning muscles). In a computational analysis, the choice bias was best captured by a bonus proportional to mood level, which was added to the decision value integrating the rewards and costs specific to presented options. Together, these results confirm the theory that mood affects decision by forming a prior intention about whether to face costs and seek for more rewards. Because this choice bias is automatically applied even when not adaptive, it allows mood to spill over many sorts of decisions and generate irrational behaviors.

Invited Lecture: Michael Richter

THE PSYCHOPHYSIOLOGY OF MENTAL EFFORT

M. Richter (Liverpool John Moores University, United Kingdom)

Mental or cognitive effort has been a topic of psychophysiological research for a very long time. For more than one hundred years, psychophysiologicalists have used various physiological measures like heart rate, pupil diameter, event-related desynchronization, or blood pressure to test effort-related predictions and applications. I will provide a brief overview of current theorizing on mental effort and the employed physiological measures and use this overview to illustrate two main interpretative pitfalls in using physiological measures to examine mental effort: circular reasoning—which is mainly found in theory-driven empirical work—and incorrect attribution of marker characteristics to physiological correlates of mental effort—which is mainly observed in applied work. Moreover, I will discuss the consequences resulting from these interpretative mistakes and present guidelines that help researchers to avoid these pitfalls and to protect the integrity of psychophysiology as scientific discipline.

Invited Lecture: David Sander

AFFECTIVISM AND THE EMOTIONAL BRAIN

D. Sander (University of Geneva, Switzerland)

While acknowledging that behaviourism and cognitivism approaches are of considerable importance to increase our understanding of several aspects of emotions, we will discuss the recently proposed notion of affectivism, as a complementary approach. If cognitivism is conceived of as an approach in which the inclusion of cognitive processes in models of behaviour, mind, and brain increases the power to explain not only cognitive phenomena but also behaviour, then affectivism would be the approach in which the inclusion of affective processes in such models not only explains affective phenomena but, critically, further enhances the power to explain cognition and behaviour. This broad approach will be the basis of a discussion concerning the emotional brain and models of emotion. This discussion will present a multi-componential definition of emotion: a particular event is first appraised by the individual according to their current concerns, values, and goals (or, more generally, motivational processes). Then, this elicitation process can trigger an emotional response in multiple components: autonomic physiology, action tendency, expression, and feeling. These processes modulate cognitive processes such as attention, memory, learning, and decision-making. Such interactions between numerous mechanisms involve complex - small and large scale - neural networks constitutive of the emotional brain. Most theories of emotion agree that the amygdala is a key region of the emotional brain, but important debates exist with respect to its specific function. A particular focus of the presentation will review results suggesting that the amygdala is not specific to the emotion of "fear" or to the affective dimension of "arousal" but is rather a key region that subserves the appraisal of concern-relevance. We will discuss the idea that this amygdala-based mechanism is a key basis of appraisal effects both on the emotional response and on several cognitive mechanisms.

Monday, June 26th

16:00 - 18:00 *MR030*

RECENT ADVANCES IN NEUROIMAGE AND MODULATION FOR PSYCHIATRIC DISORDERS

Chair: C. Luo (University of Electronic Science and Technology of China)

Neuroimaging detects structural and functional profiles facilitating the diagnosis and the development of new medications of psychiatric disorders. Noninvasive brain stimulation such as repetitive transcranial magnetic stimulation is considered as a neuromodulation tool to modulate cortical excitability and brain networks directly. Neuroimage-guided modulation offers a novel intervention approach for psychiatric disorders.

Local changes in function and microstructural features of superficial white matter in patients with schizophrenia

J.N. Gong (Chengdu University of Information Technology, China)

The present study focused on functional and structural changes in schizophrenia in superficial white matter. ALFF, FCD, and FA maps were projected onto superficial white matter surfaces. The sensorimotor and association network were located as the most changed region in schizophrenia, which may relate to the neural mechanism of symptoms.

The effects of network-targeted tDCS on the connectivity of core brain networks

H.C. Li (University of Electronic Science and Technology of China)

The network-targeted tDCS can modulate the functional connectivity between the targeted network and high-order cognitive network and the functional connectivity between high-order cognitive networks, which provided the theoretical basis for treating psychiatric disorders by network-targeted tDCS.

Pain sensitivity and brain descending pain modulatory system

H. Hui (University Of Electronic Science And Technology of China)

Our researches investigated the functional hierarchy organization from PAG to PFC during ongoing painful stimulation, which provide critical experimental evidence for understanding the neural endogenous analgesic system in human brain. Moreover, Our finding has important implications for understanding the pathological mechanism of schizophrenia.

Linking progressive functionality to symptoms and genetics in schizophrenia

S.S. Jiang (University of Electronic Science and Technology of China)

A duration-sliding dynamic analysis framework is conducted to investigate trajectories along with disease, which recognizes progressive symptoms after diagnosis, corresponding functional neuroimage phenotypes, and associated genetic factors in schizophrenia. Identifying dysfunctionality complements existing findings of structural abnormalities and could provide potential targets for drug and non-drug intervention techniques for the disease.

fMRI-guided individualized precise target rTMS for Tourette's syndrome

J. Wang (Chengdu Sport University, China)

Inhibitory rTMS stimulation of an fMRI-guided individualized SMA target elicited time-dependent alterations of brain function in different types of neuroactivity (amplitude and synchronization). The suppressed amplitude of fluctuations in the motor area later elevated the synchronization of neuroactivity in the inhibition control area, further enhancing motor control ability.

16:00 - 18:00 *MR040*

THE PSYCHOPHYSIOLOGY OF EFFORT: CARDIOVASCULAR AND PUPILLARY CORRELATES OF EFFORTFUL PROCESSING

Chairs: M. Richter (Liverpool John Moores University, United Kingdom), G.H.E Gendolla (University of Geneva, Switzerland)

Pupil dilation and cardiovascular reactivity are amongst the most frequently examined correlates of effort. This symposium showcases current psychophysiological research on effort by discussing effort-related cardiac and pupillary responses in the context of a variety of topics including attention, listening effort in hearing-impaired individuals, fatigue and self-control, and goal shielding.

Attention-related differences in the pupil response to secondary targets and task-irrelevant distractor sounds in a continuous speech design

L. Fiedler (Eriksholm Research Centre, Snekkersten, Denmark)

We asked if pupil dilation (PD) in response to sounds outside the focus of attention reflects both stimulus-driven and voluntary auditory attention. Our main findings are that both stimulus-driven and voluntary attention lead to increased PD, which makes PD a suitable measure of attention during continuous listening.

Effect of effortful speech perception on psychophysiological measures in normal hearing and hearing impaired adults

L. Keur-Huizinga (Vrije Universiteit Amsterdam, The Netherlands)

Hearing loss can lead to increased listening effort, fatigue and stress. Effects of effortful listening on physiological responses (pupil dilation, non-specific skin conductance responses, pre-ejection period) were assessed in normal hearing and hearing impaired adults in a speech in noise task. Preliminary data suggests significant correlations between these physiological responses.

Fatigue and self-control: An emerging analysis of behavioral restraint intensity

C. Mlynski (University of Vienna, Austria)

A recent analysis concerned with fatigue's influence on self-control implies that fatigue should consistently impair control only under certain restraint conditions. In two experiments we have tested the analysis. Findings illustrated the predictive ability of the analysis concerning behavioral restraint intensity and addressed concerns relating to Baumeister's limited resource model.

Action choice shields against explicit and implicit affective influences on effort-related cardiac response

G.H.E Gendolla (University of Geneva, Switzerland)

This talk informs about recent studies on action-shielding by choice. In contrast to assigned tasks, the personal choice of task characteristics could attenuate both explicit and implicit affective influences such as background music or affect primes on effort-related responses in the cardiovascular system.

Discussant

K. Brinkmann (University of Geneva, Switzerland)

16:00 - 18:00 *MR160*

PINK AND WHITE NOISE IN THE EEG

Chairs: R.J. Barry, F.M. De Blasio (University of Wollongong, Australia)

We describe pink and white noise in the EEG power spectrum and their valid quantification. Our papers examine the functional correlates of these noise components and demonstrate their advantageous application within studies of Major Depressive Disorder and mindfulness training, and extend their usage with frequency-PCA of noise-corrected EEG magnitude spectra.

Extracting pink and white noise from EEG spectra: Introduction to *PaWNextra*

R.J. Barry, F.M. De Blasio (University of Wollongong, Australia)

Pink noise (power proportional to $1/\text{frequency}$) has been difficult to assess in the EEG, and increasingly researchers instead extract an invalid “noise-like” aperiodic measure, underestimating the EEG oscillations. Using both simulated and real data, this introduction illustrates failures of spectral parameterisation in comparison to *PaWNextra*, a freely available valid algorithm.

Higher levels of resting-state EEG noise are differentially associated with improved performance outcomes

R.J. Barry, F.M. De Blasio (University of Wollongong, Australia)

Measures of pink ($1/f$) and aperiodic noise have been identified as likely markers of cognitive control processes. Here we use the validated Pink and White Noise extraction (*PaWNextra*) algorithm to disentangle resting-state pink and white noise components and seek their individual correlates of behavioural performance in a subsequent task.

Pink Noise, White Noise and Noise-Corrected Traditional Band Activity in Major Depressive Disorder: Associations with Psychopathology

A. E. Cave (University of Wollongong, Australia)

The stability of pink and white noise, and noise-corrected band power in each of the traditional EEG bands, was investigated in a pilot study of 12 individuals with Major Depressive Disorder (MDD). The advantages of assessing these variables in future EEG studies of MDD will be discussed.

Changes in pink and white noise in global EEG power following six weeks of daily breath-focused mindfulness meditation or classical music listening

A.T. Duda (University of Wollongong, Australia)

While the benefits of mindfulness are well-documented, the underlying mechanisms are not clearly understood. EEG data were compared following six-weeks of daily mindfulness training or classical music listening. Differences were identified between the raw and noise-free oscillations particularly in the alpha and beta bands, as well as in pink noise.

Extending applications of *PaWNextra*: Frequency PCA of resting EEG magnitude spectra

R.J. Barry, F.M. De Blasio (University of Wollongong, Australia)

Pink Noise (PN) and White Noise (WN) are defined in terms of their power-frequency dependencies; *PaWNextra* usually estimates these from EEG power spectra. However, EEG magnitudes are more useful in EEG-ERP dynamics, so here we derived PN and WN from resting EEG *magnitude* spectra, decomposing noise-free spectra with frequency PCAs.

16:00 - 18:00 **MR170**

PSYCHOPHYSIOLOGICAL MECHANISMS OF MEMORY MODULATION BY EMOTION

Chairs: M. Riegel (University of Geneva, Switzerland), U. Rimmele (University of Geneva, Switzerland), K. R. Mickley Steinmetz (Wofford College, Spartanburg, United States)

Our life is a continuous stream of experiences, yet our memories are organized into events, like chapters in a book. This process of "event segmentation" is guided by shifts of spatial and temporal context. Here, we investigated the unknown role of another critical factor modulating memory – emotion – and related physiological mechanisms.

The effect of paced breathing on psychophysiological reactivity and memory

K. R. Mickley Steinmetz (Wofford College, Spartanburg, United States)

Emotional responses can carry over to subsequent neutral information, enhancing memory for neutral stimuli that follow emotional stimuli, as opposed to those that follow neutral stimuli. Here we report the results of research designed to investigate the impact of paced breathing during neutral stimuli, on psychophysiological response and memory.

Effects of non-invasive transcutaneous auricular vagus nerve stimulation (taVNS) on emotional episodic memory: a matter of timing?

C. Ventura-Bort (University of Potsdam, Germany)

Non-invasive transcutaneous vagus nerve stimulation (taVNS) is suggested as a promising neuromodulator of cognitive and affective functions, which likely exerts its effect via the brain's arousal system. In the current talk, we present data on how tonic and transient stimulation applied during encoding influences recollection memory for unpleasant and neutral stimuli.

Examining the role of future time perspective and age-related differences in the neural time course of emotional processing and memory

J. Raw (University of Reading, United Kingdom)

Older adults typically foresee a limited future and demonstrate attenuated amygdala activity to negative over positive stimuli. To further our understanding of the mechanisms driving this positivity effect, we examined neural activity to emotional stimuli and its time course among younger and older adults while assessing their future time perspective.

Context-mediated retroactive memory effects

J. N. Thorp (Columbia University, New York, United States)

We explore how associating a thematic context with emotional arousal retroactively affects recognition and source memory for prior episodic and thematic associates.

How emotion influences memory of complex events in space and time?

M. Riegel (University of Geneva, Switzerland)

Our life is a continuous stream of experience, yet our memories are organized into events, like chapters in a book. This process of "event segmentation" is guided by shifts of spatial and temporal context. Here, we investigated the unknown role of another critical factor modulating memory – emotion – and related physiological mechanisms.

Tuesday, June 27th

09:00 - 10:30 *MR030*

FEEDBACK, BIOFEEDBACK AND NEUROFEEDBACK FOR MOTOR CONTROL TRAINING

Chairs: O. M. Bazanova (Federal Research Center of Fundamental and Translational Medicine, Moscow, Russian Federation), R. Pozzo (University of Medicine of Udine, Italy)

Feedback lies in the basis of any kind of learning or training. Moreover, it is the basic principle of sensorimotor integration. So at this symposium we'd like to discuss motor control training that use feedback, biofeedback, and neurofeedback.

Visual-auditory and force feedback in piano playing to improve the regulatory processes and performance of students

H. Gärtner (University of Music of Trossingen, Germany), R. Pozzo (University of Medicine of Udine, Italy)

Feedback on piano playing concerns two main aspects: the perspective of the interaction between teacher and learner, focusing on how technology can improve the learning process, and the combination of visual information about the forces acting on the piano keys and pedals associated with sound quality.

The Biofeedback for musicians focused on ensuring students to award their peak performance

O. M. Bazanova (Federal Research Center of Fundamental and Translational Medicine, Moscow, Russian Federation)

In this review, we describe psychophysiological studies examining multiple aspects of the use of feedback, biofeedback and in musical performance instruction. Particular attention is paid to biofeedback, which is aimed at training motor control.

Effect of HRV-biofeedback training for emotional reactivity control in athletes

A. V. Kovaleva (Anokhin Research Institute of Normal Physiology, Moscow, Russian Federation)

Emotions could influence sport performance dramatically. An appropriate emotion helps an athlete, but not relevant – will distract an athlete and decrease his/her result. The study aimed to reveal how HRV-biofeedback training could help to prevent loss of focus and do not allow an athlete to stray from the execution of automated movement.

Using the scalp tension EMG control for the increasing neurofeedback efficiency in ADHD children

O. M. Bazanova (Federal Research Center of Fundamental and Translational Medicine, Moscow, Russian Federation)

Contamination of EEG by EMG resulted from forehead muscles can explain the low efficiency of the NFT in ADHD. Here we demonstrated that the efficiency of a NFT training in ADHD can further increase by combining it with EMG.

09:00 - 10:30 *MR160*

ERROR-SIGNALLING AND EXPECTING THE UNEXPECTED

Chair: J. Todd (University of Newcastle, Australia)

Event-related potential research continues to produce results that challenge clear boundaries between perception and cognition. Even automatically elicited brain potentials appear modifiable by information typically categorised as belonging to “top-down” cognitive processes. This symposium features four presentations on the topic of whether and how much sensory error-signals display cognitive penetrability.

Beyond averaged responses: Modelling trial-by-trial changes to capture the dynamic of perception

F. Lecaigard (Lyon Neuroscience Research Center, France)

We revisit the passive auditory oddball paradigm by manipulating sound predictability and use a twofold modeling approach to simultaneous EEG-MEG recordings. Using trial-by-trial modeling of cortical responses reveals a context-sensitive perceptual learning process and using the dynamic causal modeling of evoked responses uncovers the associated changes in synaptic efficacy.

Exploring the effect of mental actions (inner speech) on electroencephalographic activity

T. J. Whitford (University of New South Wales, Australia)

Speaking-induced suppression (SIS) refers to how the sound of one’s own voice elicits smaller auditory-evoked potential components (ERPs) than identical externally generated speech. In this study a novel paradigm is used to reveal that a similar phenomenon can be observed to inner speech and is modulated by manipulating the ‘loudness’.

Effects of prediction error and adaptation vary along hierarchical brain dimensions during deviance processing

I. Schlossmacher (University of Muenster, Germany)

Perceiving unexpected changes in regular input is important for perception and action. In recent experiments, we addressed the question of what mechanisms underlie enhanced neural activity to deviant events. Results indicate that mechanisms like prediction error computation and adaptation vary along hierarchical brain dimensions during deviance processing.

Order effects in task-free learning: Tuning to information-critical sound features

J. Todd (University of Newcastle, Australia)

Event-related responses (ERPs) to patterned sound allow us to study automatic mechanisms that support efficient filtering of sound relevance. However, first learning exerts a strong and lasting influence on ERPs. This talk addresses whether first learning effects on the speed with which rare deviations are detected could reflect discrimination learning.

09:00 - 10:30 *MR170*

NEW ADVANCEMENTS IN THE NEUROSCIENCE OF PERSONALITY AND INDIVIDUAL DIFFERENCES

Chairs: V. De Pascalis (Sapienza University of Rome, Italy), J. Ciorciari (Swinburne University of Technology, Melbourne, Australia) & P. Gable (University of Delaware, United States)

The symposium is focused on the relationship between ERP and EEG oscillations measures with (1) Trait impulsivity during motivational conflicts (frontal alpha asymmetry); (2) Deficits in attentional control in social anxiety disorder; (3) High emotion dysregulation traits (brain network dynamics); (4) Personality traits of the revised-Reinforcement Sensitivity Theory.

Event-related potential correlates of social anxiety on working memory performance- an investigation of individual differences

J. Ciorciari (Swinburne University of Technology, Melbourne, Australia)

This study investigated the relationships associated with symptoms of Social Anxiety Disorder (SAD) and the Event Related Potentials (ERPs) associated with attention and memory. Data suggests, differences in processing attentional shifts and control, inhibition and the management of task demands, may highlight potential psychobiological individual differences associated with SAD.

Brain functional connectivity in women with high emotional dysregulation traits: an EEG study with alpha and gamma bands on the role of the Ventral Attention Network (VAN)

A. Angrilli (University of Padova, Italy)

The study investigated EEG-derived resting-state brain network dynamics related to high traits of emotion dysregulation. Alpha power in the Ventral Attention Network (VAN) seems to represent a potential protective factor, while Gamma functional connectivity is a promising index of the risk of developing emotion dysregulation and related psychiatric disorders.

Impact of trait impulsivity on frontal asymmetry during motivational conflict

P. Gable (University of Delaware, United States)

The current study investigated how trait impulsivity relates to frontal asymmetry during instances of motivational conflict and no conflict. Greater impulsivity relates to greater left frontal activity during motivational conflict and no conflict, indicating that impulsive individuals may not engage frontal asymmetrical activity related to motivational conflict monitoring.

09:00 - 10:30 *MR070*

THE SENSORY-DEPRIVED BRAIN AS A UNIQUE TOOL TO UNDERSTAND BRAIN DEVELOPMENT AND FUNCTION

Chairs: S. Casarotto (University of Milan, Italy) & E. Ricciardi (IMT School for Advanced Studies, Lucca, Italy)

The sensory-deprived brain has always represented a theme of curiosity for the understanding of human cognition and behavior. This symposium aims at presenting current conceptual and methodological challenges on conditions of temporary or permanent sensory deprivation and at understanding how perceptual experience sculpts the brain during development.

Rethinking the sensory deprived brain

E. Ricciardi (IMT School for Advanced Studies, Lucca, Italy)

The advent of neuroimaging led to a significant growth of studies on the sensory-deprived brain. This presentation will focus on the 'blind brain' and will offer an up-to-date overview of the neuroscientific research on congenital visual deprivation, presenting original perspectives on the development and experience-dependent refinement of brain function.

Vision and hearing share a common representation in superior temporal cortex despite the lack of multisensory experience

F. Setti (IMT School for Advanced Studies, Lucca, Italy)

Multisensory information is processed by brain regions capable of combining information across modalities. We exposed congenitally blind, deaf and typically developed individuals to distinct versions of a naturalistic stimulus. We found that vision and hearing share a common representation in the superior temporal cortex despite the lack of multisensory experience.

Auditory features modelling demonstrates sound envelope representation in striate cortex

D. Bottari (IMT School for Advanced Studies, Lucca, Italy)

Recent evidence suggests that V1 could respond to auditory stimulations. We tested whether sound envelope is mapped in V1. Results of an fMRI and an EEG experiment revealed that sound-envelope modulates V1 regardless of sound semantic content and that this activity can be suppressed in challenging listening conditions.

Sleep as a model to understand the sensory-deprived brain

I. De Cuntis (IMT School for Advanced Studies, Lucca, Italy)

The slow wave is the main hallmark of NREM sleep and has been shown to represent a reliable readout of experience- and maturation-dependent brain plasticity. We applied a protocol based on domestic overnight EEG recordings to explore the connectivity patterns characteristic of the blind brain through the analysis of sleep slow waves. Reactivity of the occipital cortex in blind subjects by combining transcranial magnetic stimulation and electroencephalography, G. Hassan (University of Milan, Italy)
The functional modifications occurring in the occipital cortex of blind subjects are difficult to investigate because of its disconnection from visual input pathways. By measuring the electroencephalographic responses to transcranial magnetic stimulation, we show significant and specific changes in the reactivity profile of the occipital cortex after loss of sight.

13:00 - 14:30 *MR160*

NEUROCOGNITIVE AND PSYCHOPHYSIOLOGICAL MECHANISMS BEHIND STRESS ANTICIPATION AND THEIR ROLE IN STRESS REGULATION

Chairs: R. De Raedt (Ghent University, Belgium), M. Pulopulos (Ghent University, Belgium) & G. Miknevičiute (University of Geneva, Switzerland)

Stress regulation plays a central role in the development of psychopathology. Importantly, the role of maladaptive stress anticipation in the process of stress regulation is poorly understood. This symposium brings together scientists using different approaches to investigate cognitive and psychophysiological mechanisms of stress anticipation and their influence on stress regulation.

Intrusive thinking unravels aberrant GABAergic reactivity and increased functional connectivity within the central autonomic network: A combined imaging spectroscopy and ecological study

C. Ottaviani (Sapienza University of Rome, Italy)

The present study combined imaging spectroscopy, resting state functional connectivity and ecological momentary assessment to support the view that intrusive thinking may be pathologically maintained via negative reinforcement, namely a reduction in autonomic arousal that prevents the transition from a relaxed state to a spike of activation.

Will you criticize me? The role of perceived criticism in social threat anticipation and stress regulation

M. Pulopulos (Ghent University, Belgium)

Perceived Criticism (PC) is a reliable predictor of clinical outcomes in several psychiatric disorders. The results of this study indicate that PC is associated with stress-related psychobiological vulnerabilities and that maladaptive anticipation of affective challenges may be a key process contributing to the predictive value of PC in clinical outcomes.

Adult age differences in the psychophysiological response to acute stress

G. Miknevičiute (University of Geneva, Switzerland)

Acute stress was induced in young and older adults in a crossover design. Age differences in cortisol, heart rate, and self-reported stress measures were assessed during the anticipation and confrontation with the stressor. Older adults were less affected by acute stress than young adults on both psychological and physiological levels.

Personality traits influence the psychophysiological anticipatory stress responses and the effectiveness of coping interventions

S.S. Schlatter (Research on Healthcare Performance, Lyon, France)

Understanding factors that influence stress responsiveness is necessary to promote individualized stress management training. Our findings demonstrate that personality traits influence anticipatory stress vulnerability and modulate coping interventions' efficiency. Whereas highly extravert individuals should use biofeedback, highly agreeableness peoples should use mindfulness to reduce efficiently psychophysiological anticipatory stress responses.

13:00 - 14:30 *MR170*

VOICE AND EMOTIONS: INSIGHTS INTO PSYCHOPHYSIOLOGICAL MODULATION DURING DEVELOPMENT

Chairs: D. Grandjean (University of Geneva, Switzerland), M. Filippa (University of Geneva, Switzerland)

It is recognized that human voices are effective and early modulators of newborn and child psychophysiology during development. The purpose of this symposium is to bring together specialists in voice and emotion in order to highlight the potential processes of such modulation from infancy through adolescence.

Preterm infants show an atypical processing of the mother's voice

D. Benis (University of Geneva, Switzerland)

Ten preterm and ten full-term newborns underwent high-density EEG recordings during mother or stranger speech presentation. Preterm infants exhibit atypical processing of the mother's naturalistic voice, which induces selective brain responses only in full-term newborns, whereas preterms are selectively activated by stranger voices in both temporal hemispheres.

Early vocal contact has beneficial effects on preterm infant's vagal activity during hospitalization

M. Filippa (University of Geneva, Switzerland)

In a randomized controlled trial, we aimed to examine the effects of Early Vocal Contact (EVC) – parental singing and speaking – on preterm newborns' vagal activity and autonomic nervous system maturation. A significant positive effect of EVC has been uncovered, which is largely driven by maternal singing.

Characterizing the effects of shared activity tasks on cardiovascular dynamics in term and preterm infants: a preliminary study

L. Lavezzo (University of Pisa, Italy)

We aimed evaluate the effects of parent-infant shared activities – book reading and playing - on cardiovascular dynamics of term and preterm infants at 9 months of age. Investigating standard frequency features and nonlinear dynamics in the phase space, differential effects of the shared activities were found in the two groups.

An ontogenetic perspective of vocal emotion recognition

D. M. Grandjean (University of Geneva, Switzerland)

We investigated how emotional prosody recognition develops from childhood through adolescence. We presented 133 6- to 17-year-olds with four linguistically meaningless emotional and neutral stimuli. Age improved emotional and neutral vocalization recognition, and older participants were more likely to identify multiple emotions in emotional prosody.

13:00 - 14:30 *MR070*

FREQUENCY PRINCIPAL COMPONENTS ANALYSIS (FPCA) OF RESTING EEG: CLINICAL APPLICATIONS

Chairs: G. Steiner-Lim (Western Sydney University, Penrith, Australia), F. De Blasio (Western Sydney University, Penrith, Australia)

In this symposium we use frequency principal components analysis (fPCA) to identify spectral profiles from resting state EEG in clinical samples. We provide a detailed examination between clinical outcomes and data-driven neuronal oscillatory signatures in mild cognitive impairment, subjective cognitive decline, and endometriosis-related chronic pelvic pain.

Resting state eyes closed EEG component amplitudes indicate a unique spectral profile in people with mild cognitive impairment: a comparative fPCA study

K. Christofides (Western Sydney University, Penrith, Australia)

Alzheimer's disease (AD) and the prodromal phase, mild cognitive impairment (MCI), are characterised by accelerated age-inappropriate cognitive decline. This comparative study uses frequency principal components analysis (fPCA) on resting state eyes closed EEG component amplitudes in people with MCI and healthy controls to ascertain a spectral profile for prodromal AD.

The effects of Sailuotong on resting EEG frequency components and plasma pro-inflammatory cytokines in people with mild cognitive impairment

G. Steiner-Lim (Western Sydney University, Penrith, Australia)

Frequency principal components analysis (fPCA) was applied to resting eyes-closed EEG spectra in people with mild cognitive impairment participating in a clinical trial of a standardised herbal medicine containing extracts from ginseng, ginkgo, and saffron. Treatment-effects on fPCA component amplitudes were assessed and correlated with cognitive function and inflammatory markers.

Resting EEG of older adults with subjective cognitive decline versus healthy controls: an fPCA study

A. E. Cave (Western Sydney University, Penrith, Australia)

Frequency principal components analysis (fPCA) was applied to resting electroencephalography (EEG) in eyes-closed and eyes-open conditions in order to determine neuronal differences between older adults with subjective cognitive decline, and matched healthy controls.

Frontocentral delta-beta amplitude coupling and its association with chronic pelvic pain in women with endometriosis compared to healthy controls: an fPCA study

F. De Blasio (Western Sydney University, Penrith, Australia)

Frequency principal components analysis (fPCA) was applied to resting eyes-closed EEG spectra in women diagnosed with endometriosis and chronic pelvic pain, and healthy, pain-free controls. Group and topographic effects were assessed in the corresponding fPCA components, and their amplitudes correlated with measures of pelvic pain across groups.

16:00 - 18:00 *MR030*

RECENT ADVANCES IN THE PSYCHOPHYSIOLOGY OF EFFORT I: COMPENSATORY PROCESSES AND SELF-CONTROL

Chair: J. Falk, (University of Geneva, Switzerland)

This symposium brings together recent advances in understanding the psychophysiology of effort. We present laboratory experiments investigating the impact of pain, cognitive conflict, ambient lighting, and aversive noise on the autonomic nervous system. We further focus on the beneficial effects of action control and the role of self-control over time.

Interaction between perceptions of effort and pain during motor and cognitive tasks

T. Mangin (University of Montreal, Canada)

To maintain performance in the presence of pain, effort should be increased for compensating the negative effects of pain on performance. Additionally, effort and attention allocation has been proposed to have an analgesic effect. Our results confirmed this interaction between effort and pain during completion of motor and cognitive tasks.

Ambient lighting and effort-related cardiovascular response

R. Lasauskaite (Psychiatric Hospital of the University of Basel, Switzerland)

We present empirical studies testing effects of light on effort-related cardiovascular response. The results show that exposure to high correlated color temperature (CCT) of light leads to lower effort during a subsequent cognitive task compared to low CCT. This effect holds for visual and auditory sensory inputs during cognitive tasks.

Choice, noise, and effort: Personal choice shields against noise effects on effort-related cardiovascular response

J. Falk, (University of Geneva, Switzerland)

Two experiments tested whether choice vs. assignment of task characteristics moderates the effect of noise stimulation on effort-related cardiovascular response. Results show that choosing task characteristics indeed leads to shielding against noise on effort-related cardiovascular response, whereas individuals remain receptive for noise stimulation when task characteristics are externally assigned.

Is implicit cognitive conflict really effortful? Insights from studies on effort-related cardiac response

Y. S. Bouzidi (University of Geneva, Switzerland)

Cognitive conflict is usually described as being effortful. However, there is little conclusive empirical evidence supporting this idea. In this talk, we present conflict effects on effort-related cardiac responses using a priming paradigm, and further show that action control processes are highly beneficial for counteracting this effect.

The performance continuum – predictors of sustained self-control over time

L. Roth (University of Vienna, Austria)

Motivation intensity theory (MIT) has illustrated an ability to accurately predict effort. Yet, the models usability has been questioned, due to its perceived inability to predict performance. In a series of studies, we demonstrated MIT's ability to predict performance when disengagement as opposed to effort is utilized.

Discussant

K. Brinkmann (University of Geneva, Switzerland)

16:00 - 18:00 *MR160*

THALAMIC AND PRIMARY VISUAL CORTEX CONTRIBUTIONS TO EARLY VISUAL PROCESSING REVEALED BY THE N40 AND C1 ERP COMPONENTS

Chair: G. Pourtois (Ghent University, Belgium)

In humans, early visual processing in the thalamus and V1 can be assessed by recording non-invasively and analyzing specific visual event-related potentials (ERPs), namely the N40 and C1. This symposium focuses on them, their electrophysiological properties, neural mechanisms but also susceptibility to either attentional or emotional factors.

Detection of emotional visual stimuli before 50 milliseconds

L. Carretié (Universidad Complutense de Madrid, Spain)

ERPs reveal that emotional silhouettes elicit greater N40 - P80 peak-to-peak amplitudes than neutral when presented at fixation. These latencies rule out the involvement of the amygdala in initial emotional detection and support recent proposals underlining the active role of visual thalamic nuclei in this function.

Sensory and attentional properties of human scalp-recorded N40 visual evoked potential

A. M. Proverbio (University of Milano-Bicocca, Italy)

Visual evoked potentials (VEPs) were recorded from the scalp of healthy volunteers in response to attended and unattended spatial frequency gratings. VEPs deriving from the thalamus were found to be modulated by alertness and attention at about 30-55 ms post-stimulus. The properties of newly defined visual N40 component are discussed.

Towards the neural mechanisms underlying C1 modulations

K. Rauss (University of Tübingen, Germany)

Recent evidence indicates that under certain circumstances, C1 amplitudes can be modulated by top-down factors including spatial attention. I will argue that focusing on the neural mechanisms underlying selective C1 modulations will advance our understanding not just of early visual processing, but of integrative neural activity more generally.

The influence of occipito-parietal alpha phase on visual processing and motor preparation

M. Ruzzoli (Basque Center on Cognition Brain and Language, Spain)

The phase of alpha-band oscillation (8-14 Hz) around the onset of a visual stimulus has been hypothesized to favour or disfavour subsequent responses. We assessed behavioural and neural alpha phase dependency in three conditions: 1) Spontaneous movement in the absence of visual stimulation; 2) Reaction to visual stimulation; 3) Passive visual stimulation. A significant phase opposition was found only when contrasting the high vs low amplitude of an early visual evoked potential (C1-component), suggesting a role of the alpha-phase for visual but for motor components.

Distinct top-down modulatory effects on the striate C1 ERP component

G. Pourtois (Ghent University, Belgium)

We recorded the C1 to peripheral distractors while participants performed either a low or high attention demanding task at fixation. Results showed that if this task at fixation also included a working memory component, then the normal gating of the C1 with attentional load was abolished or even reversed.

16:00 - 18:00 *MR170*

NEW ADVENTURES IN EMBODIED COGNITION: THE ROLE OF SENSORIMOTOR INTEGRATION IN THE EXPERIENCE AND PERCEPTION OF AFFECT

Chair: L. Ceravolo, (University of Geneva, Switzerland)

In this symposium, we will be looking at ways of advancing methodological aspects pertaining to embodied cognition theories. We will indeed discuss whether and how bodily inputs influence visual and auditory emotion perception and production, as well as how visual information affects the brain's somatosensory responses.

Neural networks of vocal emotion production mechanisms and correlates of bodily vibrations

L. Ceravolo, (University of Geneva, Switzerland)

Neural mechanisms pertaining to vocal emotion production were so far understudied. This is especially true when considering the impact of auditory and vibratory feedback. In the present fMRI study, we attempted to understand the potential role of vocal tract vibratory signals in the expression of vocal emotion.

An ERP study of the influence of bodily resonances on emotional prosody perception

G. Seloese, (University of Geneva, Switzerland)

The behavioural and neural influences of body vibrations originating in the vocal chords while humans express emotion was so far understudied. Here, we present behavioural and EEG data showing that speakers use such vibrations in their throat, potentially as an interoceptive feedback signal that modulates vocal emotion perception.

Reduced somatosensory processing of emotional expressions in autism spectrum disorder

M. Fanghella (University of Milan, Italy)

This study investigates, by means of EEG, differences in somatosensory processing of emotions between ASD and neurotypical individuals. Results revealed that ASD had reduced SEPs amplitudes (free from VEPs) compared with TD during emotion but not gender task. In addition, autistic traits correlated with SEPs amplitudes evoked during emotion task.

Observing evoked brain potentials during facial neuromuscular electrical stimulation

J. Baker (University of Essex, Colchester, United Kingdom)

Activations of facial muscles can guide our experience and perception of affect. fNMES allows for the precise control of such activations and could be a promising new technique for exploring facial feedback effects. I will discuss the challenges (and advantages) of combining fNMES with EEG.

Induced happiness perception in ambiguous facial expressions – a functional neuromuscular electric stimulation (fNMES) and EEG study

T. Efthimiou (University of Essex, Colchester, United Kingdom)

The relationship between facial expression production and emotion perception was explored using facial neuromuscular electrical stimulation (fNMES). fNMES-induced smiling increased the odds that ambiguous facial expressions are perceived as happy, rather than sad, and led to a larger N170 in response to happy faces. Results support theories of embodied cognition.

16:00 - 18:00 *MR070*

THE GLOBAL BRAIN CONSORTIUM EEG PROJECT

Chairs: P. A. Valdes-Sosa (University of Electronic Science and Technology of China/Cuban Neuroscience Center), Y. Pavlov (University of Tuebingen, Germany)

This symposium summarizes the purposes and results of the Global Brain Consortium's (<https://globalbrainconsortium.org>) Project for global EEG norms

The harmonized QEEG improves the classification of subtypes of developmental dyslexia

Giuseppe A. Chiarenza (CIDAAl, Milano, Italy)

A new methodology to identify different EEG patterns of developmental dyslexia is presented. The subjects with a different patterns of dyslexia, dysphonetic, dyseidetic, and mixed were identified with the Direct test of reading and spelling. The classification procedure using the Harmonized Riemannian Cross-spectra significantly improved the distinction of subtypes of dyslexia completely separated from the controls.

Delivering #EEGManyLabs – challenges and opportunities

Y. Pavlov (University of Tuebingen, Germany)

#EEGManyLabs, an international effort to replicate influential EEG studies will soon start acquiring data. Twenty-seven studies have been identified and 132 teams have been assembled. We report on progress, describing challenges and opportunities faced, and communicate plans to support the field through the development of new open science resources.

qEEG mediates the effect of infection severity on COVID-induced brain dysfunction

Y. Jin (University of Electronic Science and Technology of China)

Quantitative electroencephalogram (qEEG) as the proxy of brain function to investigate the mediation effects between COVID-19 severity and post-COVID neuropsychiatric symptoms (post-COVID NPS). This study shows that qEEG (brain) mediates the effects of COVID severity upon three-months post Covid neuropsychiatric symptoms.

Distributed multinational harmonized qEEG study: A paradigm shift of qEEG study

M. Li (Hangzhou Dianzi University, Zhejiang, China)

The open science force qEEG study change the research mode to improve reproducibility and credibility. Here, we illustrate the new paradigm with the multinational harmonized qEEG norms study with 1564 normal subjects from 9 countries, which extends frequency domain qEEG which pursues higher sensitivity of Brain Developmental Disorders detecting.

The global brain consortium efforts for open science in electroencephalography

P. A. Valdes-Sosa (University of Electronic Science and Technology of China/Cuban Neuroscience Center)

GBC efforts to promote Open-Science regarding Data and Software are explained as well as collaborative testing of EEG related algorithms.

18:00 - 19:00 *MR160*

EVENT-RELATED POTENTIAL STUDIES RELATING TO BRAIN MICROSTATES, INTELLIGENCE, AND REHABILITATION.

Chairs: T. Collura (Brain Enrichment Center, Bedford, United States), T. Feiner (IFEN, Munich, Germany)

This symposium consists of presentations describing up to date work on EEG and event-related potentials related to cognitive processes and mental states. Both averaged evoked potentials and also brain activation imaging have been used to demonstrate dynamic brain processes, as well as changes due to interventions, and the passage of time. Authors will present on original methods and results achieved within the past two years, reported here in original form.

Mindset awareness and management protocols using real-time frontal gamma asymmetry

R. Bonnstetter (Target Training International, Scottsdale, United States)

Recent developments in neuroscience allow researchers and clinicians to access the very core of human behavior—insights that can help maximize human potential personally, professionally, as well as social interactions. This presentation will describe gamma hemispheric asymmetry, thus providing a platform to study cognition, motivation, emotions, behavior, and personality.

Frontal P300 evoked potentials discriminate cognitive and memory disturbances

T. Feiner (IFEN, Munich, Germany)

Frontal P300 ERP results will be shown, in early detection of cognitive impairment and disorders of working memory. Differences in intelligence and short-term memory, using a flanker task, show extreme differential impairment (high intelligence with low working memory).

Movement-related potentials and intelligence

G.A. Chiarenza (CIDAAI, Milan, Italy)

The relationship between intelligence and brain electrical activity has long aroused the interest of many researchers. Quantified EEG and event-related potentials have contributed significantly to the development of this topic. Conversely, movement-related potentials have contributed little for both adults and children. This study analyses possible relationships between intelligence and movement-related potentials.

Wednesday, June 28th

09:00 - 10:30 *MR030*

USING PSYCHOPHYSIOLOGICAL METHODS TO UNDERSTAND AND ENHANCE THE SAFETY OF HUMAN MOBILITY

Chairs : F. Mazerès (Université Gustave Eiffel, France), A. Béquet (Université Gustave Eiffel, France)

Internal states and aging have an impact on human mobility. Psychophysiological methods can detect these states and processes to ensure a safe and sustainable mobility. Four presentations showcase novel findings from mobility research and specify the impact of aging and internal states on physiological outcomes during walking or driving.

The use of a breathing biofeedback for stress management while driving: Examining the influence of individual characteristics

A. Béquet (Université Gustave Eiffel, France)

This study investigated the efficiency of a breathing guidance to regulate stress in driving. Traits linked to inattention errors and prosocial behaviors in driving, and to the guidance's ease of synchronization impacted its effectiveness. Efficiency of the guidance was determined by its perceived salience, which may vary among individuals.

Physiological detection of sadness and its regulation in autonomous driving

F. Mazerès (Université Gustave Eiffel, France)

This study identified sadness during autonomous driving by using physiological parameters (ECG, respiratory and EDA) and evaluated the subjective mood of participants. We used a haptic stimulation technique for remediate sadness. Physiological and subjective data revealed that participants were correctly induced in sadness. The haptic regulation showed encouraging subjective results.

Prefrontal activity during walking in normal and pathological aging

I. Hoang (Université Gustave Eiffel, France)

Studying prefrontal activity during walking could help to better understand the changes with advancing age and to identify people at risk of falling earlier. The results showed a progressive increase in prefrontal activity with age and Parkinson's disease meaning a greater demand on executive resources to perform the walking task.

Unrelated driving thoughts and car driving: Contribution of event-related potentials

A. Fort (Université Gustave Eiffel, France)

This presentation illustrates how electrophysiological data as ERPs may be used in the applied context of car driving to understand how unrelated driving thoughts impact the behavioral and information processing of visual relevant information for driving.

09:00 - 10:30 *MR160*

THE ROLE OF ATTENTION IN THE DEVELOPMENT OF SPEECH PERCEPTION

Chairs: V. Shafer (City University of New York, United States), E. Sussman (Albert Einstein College of Medicine, New York, United States)

Studies presented here explore the role of attention in speech perception from infancy to adulthood. Speech and nonspeech sounds were presented under a variety of listening situations to examine the effect of bilingual/monolingual experience on speech processing. Overall, the studies demonstrate the importance of attention in speech perception development.

Development of speech-sound encoding in bilingual infants and children

V. Shafer (City University of New York, United States)

Auditory Evoked Potentials (AEPs) were recorded to a vowel in 110 bilingual Spanish-English and monolingual English children between 6 months and 7 years of age. Age modulated AEPs. Language experience effects were seen as a slow potential that reflects a difference in attention to speech.

The fostering of infants' selective perceptual routines

A. Garcia-Sierra (University of Connecticut, United States)

The positive-Mismatch Response (positive-MMR) was used to study the development of perceptual routines that facilitate automatic speech perception in a group of 11-14 month-old bilingual and monolingual infants. Results demonstrate that attentional processes vary as a function of the amount and the quality of language input received at home.

Perception and production of voice onset time in bilingual Italian-German children and monolingual German peers

Y. Yu (St. John's University, United States)

The Mismatch Response (MMR) was elicited to investigate the development of automaticity in speech sound processing (VOT) in bilingual children. Data from 40 bilingual Italian-German and monolingual German children suggests that at five years of age bilinguals are not automatic in processing. Measures of target speech sound production substantiate this finding.

Speech perception requires higher-level attentional skills

E. Sussman (Albert Einstein College of Medicine, New York, United States)

We demonstrate a task-based response bias for speech perception. A response 'advantage' was seen only when identifying and discriminating speech sounds from other complex sounds and not when simply detecting speech among other sounds. These results indicate that higher-level cognitive processes are used for speech perception.

09:00 - 10:30 *MR170*

FROM EARLY LIFE ADVERSITIES TO ADVERSE HEALTH OUTCOMES: A TRANSLATIONAL PRECISION-BASED APPROACH

Chair: C. Ottaviani (Sapienza University of Rome, Italy)

Early-life adversity, in the form of maltreatment, neglect, or trauma during childhood, increases the life-long risk for negative health outcomes. The underlying psychoneurobiological mechanisms, however, remain unknown. Adopting a causative approach, the symposium combines preclinical and clinical research to provide mechanistic insight and inform timely and targeted prevention strategies.

Identification of biological and psychological consequences of child maltreatment using a multidimensional approach

V. Carola (Sapienza University of Rome, Italy)

Child maltreatment affects child development in behavioral, emotional, social, physical, and cognitive areas. Several alterations in different biological systems are involved in the "translation" of early-life traumatic experiences into psychological and medical diseases in adulthood.

Cardiac implications of vicarious social stress in female rats

L. Carnevali (University of Parma, Italy)

Women are particularly vulnerable to the effects of social stress on the heart, but this relationship remains understudied at the preclinical level. This study shows that female rats which repeatedly witnessed the social defeat bout of a male conspecific developed cardiac alterations that may increase their risk for cardiac disorders.

Towards modelling the complexity of early life adversity

C.S. Sigrist (University of Cologne, Germany)

Despite extensive literature, existing studies to date have not been able to provide conclusive insight into direct effects or interactions between different forms of early life adversity (ELA), and between ELA, outcomes of interest, and mediating physiology. We illustrate how network analysis may provide new insight into these complex relations.

The role of the vagus in resilience: A neurovisceral integration perspective

J. F. Thayer (University of California, Irvine, United States)

The vagus nervous system is important for the psychophysiological balance of an organism. HRV may buffer the effects of early life adversity on health outcomes in both childhood and adulthood. Children and adults with greater resting HRV show resilience to early life adversity.

13:00 - 14:30 *MR160*

PSYCHOPHYSIOLOGY OF AGGRESSION

Chair: J. Armony (McGill University, Canada)

It is unclear what neural mechanisms underlie different types of aggressive behavior and what they have in common. This symposium presents four studies on aggression in diverse populations, including typical participants, psychiatric patients and combat sports athletes. Behavioral, psychophysiological and neuroimaging data are presented to understand different aspects of aggressive conduct.

Psychophysiological correlates of aggression in healthy participants and patients with borderline personality disorder and depression

S. Boccadoro (RWTH Aachen University, Germany)

Investigation of proactive aggression in laboratory paradigms is scarce. We developed a competition task to identify behavioral and psychophysiological correlates of proactive and reactive aggression in healthy participants. In a follow-up study, we investigated patients with borderline personality disorder and depression applying the proactive aggression task.

Transdiagnostic investigation of anger and aggression in mental disorders

L. Wagels (RWTH Aachen University, Aachen, Germany)

Despite the high prevalence of aggression across mental disorders, studies on shared and distinct mechanisms are rare. We investigated emotional, behavioral and physiological reactions to provocation in patients (major depressive disorder, schizophrenia, alcohol dependence, and cluster B personality disorder) and healthy controls revealing both diagnosis-specific and transdiagnostic patterns.

Understanding aggression in combat-sport athletes

M. A. Bobes León (Cuban Neuroscience Center, La Habana, Cuba)

Aggression could have positive connotations, for instance in combat sports, where violent behavior is accepted and necessary to winning the competition. We examine aggressive traits and neural circuitry associated to positive aggression by studying combat-sport athletes. Positive and pathological aggression showed similar same neural profile but differed in impulse control.

Individual differences in antisocial personality traits are associated with distinct patterns of emotional somatosensation and natural body posture

S. Wainio-Theberge (McGill University, Montreal, Canada)

Aggression and antisocial tendencies are embodied phenomena mediated by body posture and somatosensation. Here, we investigated individual differences in posture and somatosensation in relation to antisocial personality traits. We found that psychopathy and social dominance were associated with erect body postures and reduced somatosensation from the heart and viscera.

13:00 - 14:30 *MR170*

PSYCHOPHYSIOLOGICAL MARKERS OF ACUTE MENTAL FATIGUE

Chairs: M. Audiffren (Université de Poitiers, France), N. André (Université de Poitiers, France)

Acute mental fatigue has been studied during several decades and debates still remain on its conditions of occurrence and the mechanisms that support its manifestations. The present symposium examines the contribution of psychophysiology and brain imaging to the understanding of this complex phenomenon.

The psychophysiological markers of mental fatigue and its carryover effects

J. Van Cutsem (Royal Military Academy, Brussels, Belgium)

Mental fatigue negatively impacts work-related activities, sport performance and general wellbeing. The mechanistic discussion on mental fatigue can be divided in 1) the time-on-task effect and 2) the carryover effects. The results of two interventional studies will be presented and will demonstrate the multifactoriality of carryover effects.

Does cognitive fatigue influence the performance of endurance athletes in a time-to-exhaustion handgrip task?

S. Daneshgar-Pironneau (University of Poitiers, France)

The principal aim of this study was to examine the effect of cognitive fatigue on a subsequent physical time-to-exhaustion handgrip task in endurance athletes and non-athletes. Cognitive fatigue led to a significant performance decrement in non-athletes while the performance of the endurance athletes was unimpacted.

Weakening of working memory capacity by using a long and effortful task as the depleting task and its effect on cardiac reactivity

A. Lorcery, (University of Poitiers, France)

This study combined the time on task and sequential task protocols to examine the effect of mental fatigue on working memory. Results showed that a long and effortful working memory task impaired performance on a subsequent working memory task. Heart rate variability suggests a disengagement of effort in both conditions.

Cognitive incapacitation: Theoretical and methodological considerations

C. T. Albinet (Université de Toulouse INU Champollion, France)

The talk will introduce the phenomenon of cognitive incapacitation and will discuss theoretical and methodological aspects of this concept in relation to the broader field of mental fatigue. Behavioral and psychophysiological correlates of cognitive incapacitation will be presented and discussed.

16:00 - 18:00 *MR030*

ADVANCES IN THE PSYCHOPHYSIOLOGY OF AFFECTIVE LEARNING AND DECISION-MAKING

Chairs: Y. Stussi (University of Geneva, Switzerland), E.R. Pool (University of Geneva, Switzerland)

This symposium brings together recent advances in the study of the psychophysiological determinants and correlates of how humans learn to attribute affective value and make decisions. Across five talks featuring behavioral, psychophysiological, neural, and computational techniques, the symposium fosters insights into the psychophysiology of (mal)adaptive affective learning and decision-making processes.

Theta and alpha power track the acquisition and reversal of threat learning and correlate with autonomic arousal

F. Starita (University of Bologna, Italy)

Flexibly adjusting one's threat predictions to meet the current environmental contingencies is crucial to survival. We show that changes in theta and alpha oscillations mark the acquisition and reversal of threat predictions and correlate with autonomic arousal, establishing a direct relationship between activation of the central and peripheral nervous systems.

Psychophysiological and computational correlates of enhanced Pavlovian threat conditioning to positive and negative emotional stimuli

Y. Stussi (University of Geneva, Switzerland)

This study shows that both negative and—strikingly—positive emotional stimuli elicit more resistant-to-extinction conditioned skin conductance responses than neutral stimuli during Pavlovian threat conditioning. Computational modeling analyses using reinforcement learning indicated that these effects were characterized by a lower inhibitory learning rate that contributed to weakening extinction learning.

Neurocomputational mechanisms of affective learning underlying problematic reward-seeking behavior

E.R. Pool (University of Geneva, Switzerland)

The present series of studies supports the existence of parallel Pavlovian predictions about multiple aspects of the outcome (e.g., the location of its delivery and its affective value). Strikingly, these parallel predictions adapt differently to changes in outcome value. This provides new insights into the understanding of problematic reward-seeking behaviors.

The “motor-way” to decision-making: How the motor system drives cue-guided choice

S. Garofalo (University of Bologna, Italy)

The present study shows the involvement of the premotor system in cue-guided decision-making, supporting the idea that the motor system is not downstream to the decision process, but actively contributes to the influence that reward-associated cues can exert on choice.

Dissociable effects of cognitive control and motivation during reinforcement learning in depression

G. Pourtois (Ghent University, Belgium)

We recorded EEG in depressed patients during a standard reinforcement learning task prior to and following a rTMS-based intervention. Results showed that whereas mid-frontal theta did not change as a function of treatment and mood improvement, frontal alpha asymmetry did and normalized.

16:00 - 18:00 *MR040*

BRAIN-APPARATUS CONVERSATION

Chair: S. Ferraro (University of Electronic Science and Technology of China)

Brain-Apparatus Conversation is a new and rapidly developing field that capitalizes on progress in cross-disciplinary research. This approach integrates recent advances in technology and engineering disciplines with progress in cognitive neuroscience, clinical sciences, and information sciences, which may help develop bio-inspired information and communications technologies.

Brain-wave music and the applications

J. Lu (University of Electronic Science and Technology of China)

Brain-wave music is generated from EEG data. Recently brain-wave music has shown positive effects on sleep, emotion, and cognitive interventions, leading us better to understand the underpinnings between the brain and music.

Habenula volume and functional connectivity changes following laparoscopic sleeve gastrectomy for obesity treatment

Y. Zhang (Xidian University, Xi'an, China)

Laparoscopic sleeve gastrectomy (LSG) significantly increased habenula gray-matter-volume and changed resting-state-functional-connectivity between the habenula and regions implicated in interoceptive, emotional, somatosensory/motor processing, and homeostatic/hedonic regulation. Bidirectional relationships between habenula volume and resting-state-functional-connectivity of habenula-insula might in part mediate long-term benefits of LSG in negative emotional-related eating behaviors and weight loss.

The cognitive control mechanism of improving emotion regulation: A high-definition tDCS and ERP study

R. Zhou (Nanjing University, China)

The neuroenhancement mechanisms of tDCS over DLPFC modulating cognitive reappraisal remain unclear. This work verified the causal role of DLPFC in different tactics of cognitive reappraisal and cognitive control mediated the effect of tDCS on emotion regulation.

Autonomic system and central autonomic network technological interfaces: Current challenges in the field

S. Ferraro (University of Electronic Science and Technology of China)

The development of robust technologies interfacing brain and autonomic system allowing innovative treatments is strongly impeded by the fragmented knowledge in the field. We have (1) conducted a neuroimaging meta-analysis redefining the central autonomic system in healthy subjects, and (2) identified the main challenges in the field.

Gray matter volume atrophy related to glucose disturbances in schizophrenia with comorbidity of metabolic syndrome affected psychosis and therapeutic outcome: A Cross-Sectional and Longitudinal Study

J. Zhou (University of Electronic Science and Technology of China)

The relationship between reduced grey matter volume (GMV) related to abnormal glucose metabolism and psychiatric symptom in schizophrenia with comorbidity metabolic syndrome (MS) is unclear. This study revealed that GMV atrophy related to glucose disturbances in patients with comorbidity MS implicated in worse negative symptoms and therapeutic outcome of schizophrenia.

16:00 - 18:00 *MR160*

INFLUENCES OF IN VIVO AND EX VIVO FORCES ON COGNITIVE CONTROL FUNCTIONS

Chairs: M.J. Larson (Brigham Young University, Provo, United States), P.E. Clayton (University of South Florida, Tampa, United States)

Cognitive control component processes can be disrupted or enhanced by in vivo and ex vivo forces that can alter decision-making. We present data on the interaction and impact of cognitive control physiology and behavior in instances of psychopathology, sex hormones, substance use, adverse childhood experiences, and concussion.

Cognitive control alternations in socially anxious adults: A utility for a novel attention bias modification training

A. Umemoto (Columbia University, New York, United States)

We investigated whether electrophysiological correlates of performance monitoring predicted response to a novel music-based attention bias modification procedure. Error-related negativity and frontal midline theta power predicted symptom improvement suggesting that hypervigilance to error may be an important indicator of treatment response.

Ovarian hormones shape associations between neural indices of cognitive control and anxiety

C. Webster (Michigan State University, United States)

It has long been recognized that anxiety impacts cognitive control. However, it is only in recent history that the critical role of ovarian hormones has been considered in cognition. This talk merges these lines of inquiry to reveal that ovarian hormones shape associations between cognitive control and anxiety.

Inhibitory control in substance use disorders: Disentangling substance use and substance-related problems

Malin K. Hildebrandt (TU, Dresden, Germany)

Inhibition-related frontal hypo-activity is a potential risk factor for substance use disorders, but evidence for a specific link to substance-related problems is lacking. We show an association of hypo-activity with problems when statistically controlling for the degree of use, and hyper-activity associated with use, which may explain previous inconsistent findings.

Reduced discrimination between signals of danger and safety but not overgeneralization is linked to exposure to childhood adversity

A. Koppold (University Medical Center Hamburg-Eppendorf, Germany)

We investigate fear acquisition and generalization in 1396 healthy individuals exposed or not exposed to adverse childhood experiences (ACE). In exposed individuals we observe blunted physiological responding specifically to the signals of imminent danger. This may represent a resilience factor in individuals mentally healthy despite exposure to ACEs.

Performance-Monitoring aspects of cognitive control remain intact following mild traumatic brain injury (concussion) at one-month and ten-month follow ups

P.E. Clayson (University of South Florida, Tampa, United States)

This longitudinal study determined whether error-related negativity (ERN) deficits are prominent acutely following concussions and whether deficits normalize over time. Findings suggest that ERN was sensitive to the cognitive sequelae of concussions only in individuals with poor cognitive function, but concussions might not result in large-scale disruptions in cognitive control.

16:00 - 18:00 *MR170*

RECENT ADVANCES IN THE PSYCHOPHYSIOLOGY OF EFFORT II: THE ROLE OF MOTOR COMMAND, RUNNING STYLES, ALERTNESS, AND SOCIAL PROCESSES

Chair: D. Framorando (University of Geneva, Switzerland)

This symposium showcases recent advances in understanding the psychophysiology of effort. We present exemplary laboratory experiments examining the role of (1) central motor command and running styles on the perception of effort; (2) alertness and social motivation on effort-related cardiovascular response in basic and applied contexts.

The central motor command, but not the muscle afferent feedback, is necessary to perceive effort

B. Pageaux (Université de Montréal, Canada)

The signal processed by the brain to generate the perception of effort (PE) is still debated. We used electromyostimulation to manipulate the magnitude of the motor command and muscle afferents during muscle contractions. Our results suggest that PE is generated by the processing of signal related to the motor command.

Effects of running style on perception of effort, energy cost and performance in competitive runners

S. Marcora (University of Bologna, Italy)

Fourteen aerial runners were compared to a gender-matched group of 14 terrestrial runners. Despite no significant differences in maximal oxygen consumption and energetic cost of running, aerials ran faster than terrestrials during two running tests. These performance differences may be explained by a lower perceived effort at high running speeds.

Impact of sleep duration, light intensity, and alertness on effort-related cardiovascular response during cognitive performance

L. Wüst (Psychiatric Hospital of the University of Basel, Switzerland)

In our study, predicted effects of sleep restriction and light intensity on cardiac pre-ejection period (PEP) were not significant. Nevertheless, high subjective sleepiness levels were associated with a PEP decrease, indicating disengagement from mental effort. The results suggest that perceived alertness might be more important than sleep duration per se.

Effect of social comparison on effort-related cardiovascular measures

D. Framorando (University of Geneva, Switzerland)

This study tested the effect of social comparison on effort during an unfixed mental concentration task. The results show that effort is higher when participants played against slightly better and similar peers than against weaker peers. Apparently, similar and better peers create upward pressure that increases potential motivation and effort.

A smile is not a smile: Implicit social motives moderate the impact of facial expressions of emotion on effort-related cardiovascular reactivity

K. Brinkmann (University of Geneva, Switzerland)

Results of two studies demonstrate that highly power-motivated individuals show reduced effort-related cardiovascular reactivity for tasks with embedded dominant displays that act as social disincentives. In contrast, highly affiliation-motivated individuals mobilize more effort in terms of cardiovascular reactivity for tasks containing friendly displays that act as social incentives.

Discussant

G.H.E. Gendolla (University of Geneva, Switzerland)

16:00 - 18:00 *MR070*

EROL BASAR'S LEGACY 5 YEARS FROM HIS LAST TRAVEL: EEG BIOMARKERS OF VIGILANCE AND COGNITIVE DISORDERS

Chairs: B. Güntekin (Istanbul Medipol University, Turkey), C. Babiloni (Sapienza University of Rome, Italy)

In this symposium, speakers will discuss abnormal brain EEG oscillations underpinning vigilance regulation and cognitive processes in patients with progressive neurodegenerative pathologies belonging to dementia, such as Alzheimer's, Parkinson's, and Lewy body disease. According to Erol Başar's legacy, their brain dynamics are unveiled by linear and nonlinear EEG methodologies.

Beyond Classification: using deep learning to characterise brain dynamical relationships

M. Zanin (Instituto De Física Interdisciplinar Y Sistemas Complejos, Spain)

Deep Learning is receiving increasing attention in many scientific tasks that go well beyond simple data classification. Here we show how Deep Learning models can be used to assess the identifiability, or uniqueness, of EEG time series, and how such uniqueness is modified in Alzheimer's and Parkinson's diseases.

Reactivity of posterior cortical electroencephalographic alpha rhythms during eyes opening in cognitively intact older adults and patients with dementia due to alzheimer's and lewy body diseases

C. Babiloni (Sapienza University of Rome, Italy)

This study unveiled a relationship between the atrophy in the cortical default mode network from structural magnetic resonance imaging and the abnormal cortical source activity from resting-state eyes-closed electroencephalographic delta-theta (< 7 Hz) rhythms in 45 Alzheimer's disease with dementia patients and 40 matched healthy elderly persons.

Event-related oscillations in Alzheimer's (AD), Parkinson's (PD) and lewy body diseases (LBD)

G. Yener (Izmir University of Economics, Turkey)

Event-related oscillations (ERO) in Alzheimer's (AD), Parkinson's, and Lewy body diseases display decreased delta/theta responses indicating cognitive impairment. Theta ERO hyperconnectivity at MCI stage is congruous with hyperexcitability in early AD. As a method investigating both hyperexcitability and cognitive impairment, electrophysiological methods may help in future work-up in these diseases.

Event related gamma phase locking in Alzheimer's disease, Parkinson's dementia and lewy body dementia during working memory paradigm

B. Güntekin (Istanbul Medipol University, Istanbul, Turkey)

The present study analyzed the event-related gamma responses in Alzheimer's disease (AD), Parkinson's dementia (PDD), Lewy Body dementia (DLB), and healthy elderly controls. Results showed that AD, PDD, and DLB patients had lower event-related gamma responses than the healthy controls. Gamma phase locking was lowest in PDD, and DLB patients.

Thursday, June 29th

09:00 - 10:30 *MR030*

FEMALE NEUROPSYCHOLOGICAL TRAITS ACROSS THE MENSTRUAL CYCLE

Chairs: O.M. Bazanova (Federal Research Center of Fundamental and Translational Medicine, Moscow, Russian Federation),

R. Zhou (School of Social and Behavioral Science, Nanjing University, China)

In this symposium we will discuss complex studies that address cognitive, motor and affective abilities affected by hormonal states, assessment of neuropsychological traits dependent on menstrual cycle, and the effect of the hormonal state on the use of neurotechnology in women.

Altered reward anticipation in women with high premenstrual symptoms: A magnetoencephalography study

R. Zhou (School of Social and Behavioral Science, Nanjing University, China)

Premenstrual syndrome (PMS) was characterized by a blunted response after receiving monetary gains in cases of random feedback but ignored reward anticipation. We recorded the magnetoencephalography in women with and without PMS during completing the monetary incentive delay task. We found PMS was associated with an increased response towards reward cues.

Increased excitation, but normal inhibition in the visual cortex in premenstrual dysphoric disorder: Evidence from MEG and perceptual suppression

E. Orekhova (Moscow State University of Psychology and Education, Russian Federation)

Analyzing visual gamma oscillations using MEG we found that neural excitability is constitutively increased in women with PMDD and is exacerbated during the luteal phase. However, normal phase-related changes in MEG gamma frequency and normal or even increased spatial suppression speak against inhibitory deficit in the visual cortex in PMDD.

Feedback and biofeedback in musical training for female students

O.M. Bazanova (Federal Research Center of Fundamental and Translational Medicine, Moscow, Russian Federation)

In the crossover within-subjects design the musical performance training efficiency (TE) was studied in female students in low and high hormonal menstrual cycle phases while they completed three practices with different type of feedback. The highest TE as a change of performance rating was found at luteal phase after biofeedback.

Neuropsychological variables across the menstrual cycle in eumenorrheic healthy women: Systematic review

O.M. Bazanova (Federal Research Center of Fundamental and Translational Medicine, Moscow, Russian Federation)

To review the current body of research that has investigated changes in psychophysiological variables during different phases of the menstrual cycle in eumenorrheic women. A literature search was conducted using search terms related to the menstrual cycle and EEG, MEG, fMRI and biomechanical measures of cognitive, psychomotor and affective functions.

09:00 - 10:30 *MR160*

PSYCHOPHYSIOLOGICAL APPROACHES TO EMOTION REGULATION AND PSYCHOPATHOLOGY: SHEDDING LIGHT ON STRATEGIES TO IMPROVE MENTAL HEALTH

Chairs: C. Webster (Michigan State University, United States), E. Kross (University of Michigan, United States)

Emotion regulation refers to a broad set of strategies that are associated with mental health and illness. This symposium brings together four talks from scientists using a range of psychophysiological measures to expand the repertoire of emotion regulation strategies and illuminate challenges still faced by those with anxiety and depression.

An emotion regulation tool for those who need it most: Leveraging language through distanced self-talk

K. Schertz (Michigan State University, United States)

“Taking a step back” to regulate one’s negative emotions is often an effortful, challenging process. We present a theoretical framework and evidence from multiple levels of analysis to support the idea that the structure of language can be leveraged to promote psychological distance and emotion regulation relatively effortlessly.

Outsourcing affect regulation to non-deceptive placebos

D. Guevarra (University of California, San Francisco, United States)

Placebos administered without deception (e.g., non-deceptive placebos) may provide an effective and relatively effortless way to help people manage their short- and longer-term affective distress. In three studies, we provide evidence that non-deceptive placebos can reduce short-term emotional distress and longer-term perceived stress, anxiety, and depression symptoms.

Anxiety interferes with cognitive emotion regulation implementation: Evidence from the late positive potential

E. Kross (University of Michigan, United States)

Anxiety and its disorders are associated with difficulties regulating emotions, although exactly how is unclear. Across three different cognitive strategies (positive reappraisal, distanced self-talk, and analysis) and four studies, we show that anxiety interferes with successful emotion regulation as indexed by the late positive potential of the human ERP.

Sensing or feeling the body: The paradox of psychosomatic processing by chronic ruminators

S.L. Koole (Vrije Universiteit Amsterdam, The Netherlands)

The psychosomatic model of rumination (Koole & Schlinkert, 2022) suggests that compared with non-ruminators, ruminators are better at sensing their body (i.e., detecting physical sensations), while being worse at feeling their body (i.e., figuring out what their bodily sensations mean). Seven preliminary studies provide evidence consistent with the model.

09:00 - 10:30 *MR170*

APPLICATIONS OF THE QUANTITATIVE EEG ANALYSIS IN CLINICAL RESEARCH

Chairs: J. Bosch-Bayard (McGill University, Canada), M. L. Bringas-Vega (University of Electronic Science and Technology of China)

Quantitative EEG Analysis (qEEG) has been widely used both for characterizing normal human brain electrical activity, as well as to find patterns of deviation from normality. In this symposium, we present efforts for obtaining age-dependent qEEG normative equations at the sources and some useful uses in psychiatric and neurodevelopmental disorders.

ERP correlates of neurocognitive impairment and negative symptoms in schizophrenia

A. Mucci (University of Campania "Luigi Vanvitelli", Italy)

Neurocognitive deficits and negative symptoms represent core, enduring features of schizophrenia, sometimes preceding its onset. Their pathophysiological mechanisms and possible biomarkers are unknown, preventing the development of innovative treatments. This presentation will summarize possible electrophysiological markers of negative symptoms and neurocognitive deficits to improve stratification of patients for personalized treatment.

Resting state electroencephalographic alpha rhythms predict and are sensitive to Alzheimer's disease mild cognitive impairment progression at a 6-month follow-up

C. Babiloni (Sapienza University of Rome, Italy)

This study unveiled the progressing abnormality of cortical source activity from resting-state eyes-closed electroencephalographic alpha (8-10 Hz) rhythms in 52 Alzheimer's disease with mild cognitive impairment patients and 60 matched healthy elderly persons at 6-month follow-ups, thus validating a physiological biomarker of quiet vigilance dysfunction.

The quantitative tomographic EEG (qEEGt) to study long effects on malnutrition

M. L. Bringas-Vega (University of Electronic Science and Technology of China)

A qEEG analysis of a 50-years longitudinal follow-up of the Barbados Nutrition Study (BNS) is presented. Children who suffered protein energy malnutrition (PEM) during the first year of life showed developmental delay in alpha rhythm and insufficient decrease in beta activity, compared to a matched Control developed in normal conditions.

13:00 - 14:30 *MR030*

TECHNOLOGY ASSISTED PSYCHOPHYSIOLOGY INTERVENTION

Chairs: J. Zhao (Shanghai Jiao Tong University, China), D. Zhu (Shanghai Jiao Tong University, China), C. Zhang (Shanghai Jiao Tong University, China)

Sensing and artificial intelligence technologies have enabled the integration of intelligent technology in health management, allowing for real-time monitoring and personalized health advice. Persuasion technology, using human-computer interaction and gamification, is a promising approach for regulating personal psychophysiology problems. Its efficacy has been examined through implemented designs.

Understanding the effects of the Kinect-based exergame on managing late-life depression

D. Zhu (Shanghai Jiao Tong University, China)

In order to investigate the efficacy of technology-assisted exercise in alleviating late-life depression symptoms and enhancing the exercise experiences, the researchers designed and implemented a randomized controlled trial using a Kinect-based exergame. The outcomes highlighted the potential advantages of technologically assisted exercise for treating late-life depression.

Understanding the role of augmented reality on the verbal intervention of autistic children

W. Yuan (Shanghai Jiao Tong University, China)

Through the design of an augmented reality (AR) educational tool and the implementation of a randomized control trial, this research investigates the efficacy of AR in enhancing the traditional verbal education for autistic children. The results suggest that AR can enhance the traditional verbal education of autistic children.

Understanding the effects of virtual reality serious games on relieving the stress of graduate students

C. Zhang (Shanghai Jiao Tong University, China)

The research investigates the potential benefits of incorporating virtual reality into serious games as a means of mitigating stress levels among graduate students. The study found that virtual reality significantly optimizes the stress-relieving effects of mobile serious games and traditional stress intervention, leading to a more effective stress management outcome.

A randomized controlled trial examined the effectiveness and feasibility of a game intervention for reducing geriatric anxiety

J. Zhao (Shanghai Jiao Tong University, China)

This study aims to comprehend the impact of the digital game intervention on the older population given. This study provides evidence that game intervention is successful in reducing geriatric anxiety through the design of a digital puzzle game and the analysis of the findings of a randomized control trial.

13:00 - 14:30 *MR160*

PSYCHOPHYSIOLOGICAL CORRELATES OF SHADES OF PSYCHOPATHY

Chair: H. Eisenbarth (Victoria University of Wellington, New Zealand)

Psychophysiological correlates of psychopathy seem to only partially reflect key characteristics of psychopathy: short-lasting emotions and low empathy. Across four talks we discuss the differential impact of measurement type and shade of psychopathy, reflected by its subcomponents.

An examination of autonomic and facial responses to prototypical facial emotion expressions in psychopathy

P. Deming (Northeastern University, United States)

We examined physiological mechanisms that may underlie psychopathic people's deficits in categorizing others' prototypical facial emotion expressions. Among N = 88 incarcerated men, psychopathy was unrelated to autonomic arousal, facial muscle response, categorization accuracy, valence ratings, and intensity ratings in response to prototypical facial emotion expressions.

Steady state visual evoked potentials reflecting psychopathic personality traits

H. Eisenbarth (Victoria University of Wellington, New Zealand)

Attention for emotional facial expressions can be reflected in visually evoked potentials. Preferential attention for angry and afraid expressions over neutral expressions has been found in general population. Here we tested whether different factors of psychopathic traits relate to more or less preferential processing of angry and afraid facial expressions.

Forbidden temptation - Sexual arousal, psychopathy and the sense of agency

A. Render (University of Passau, Germany)

Do inter-individual differences in psychopathy vary with the sense of agency in the context of emotional arousal? We showed that those higher in psychopathy were less impaired in their feeling of control over actions during high arousal. A, they were more disconnected to the consequences of their actions.

Neurotherapeutic treatment approaches for adults and adolescents with antisocial characteristics

L. Konicar (Medical University of Vienna, Austria)

Two neurobiologically based interventions, namely brain self-regulation neurofeedback training and transcranial direct current brain stimulation are presented and discussed as neurotherapeutic treatment approaches for adult offenders with psychopathy and adolescents with antisocial characteristics.

13:00 - 14:30 *MR170*

MEASUREMENT OF ERPS DURING REAL-LIFE ACTIVITIES

Chairs: M. Kimura (National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan), H. Nittono (Osaka University, Japan)

The importance of measuring human brain activities during real-life activities is increasing day by day. This symposium will discuss the potential of ERPs as a powerful tool for investigating brain functions and/or mental states during real-life activities such as driving a vehicle, watching naturalistic visual scene, and executing body movement.

What eye-event-related EEG activity can tell us about cognitive processing in real life

E. WASCHER (Leibniz Research Centre for Working environment and Human Factors, Dortmund, Germany)

Eye-blink-related potentials of the EEG provide the possibility to investigate cognitive processing in natural situations without adding artificial (locking) events. They vary with cognitive demands. An extended investigation of eye-related EEG activity (saccade preparation and fixation) in a driving simulation show that even spatial allocation of attention can be shown in natural situations.

Evaluation of viewer's interest in video clips using eye-fixation-related brain potentials

K. Fuseda (Bunkyo Gakuin University, Fujimino, Japan)

The present study investigated whether eye-fixation-related brain potentials (EFRPs), time-locked neural activities at the onset of eye-fixation, are a useful measure for evaluating a viewer's interest in videos. The results suggest that the mean amplitude of the P1 wave in the EFRPs could be used to evaluate interest.

Assessing pain-related somatosensory processing during motor goals:

An electrophysiological approach

S. Van Damme (Ghent University, Belgium)

Movements associated with pain might become threat signals resulting in increased somatosensory focus, but experimental evidence is rare. Recent work will be discussed showing that when participants perform movements that are conditioned with experimental pain, somatosensory evoked potentials to innocuous tactile stimuli at the threatened body location are enhanced.

Evaluation of the driver's mental state in real-life environments using a task-irrelevant auditory probe technique

F. Sugimoto (National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan)

The present study investigated the usefulness of a task-irrelevant auditory probe technique in the evaluation of the driver's mental state in real-life driving environments. We demonstrated that the ERPs elicited by probe stimuli could be used as an index of the amount of attentional resources allocated to a driving task.

16:00 - 18:00 *MR030*

VISUAL BRAIN: THE ROLE OF EEG ALPHA RHYTHM IN PERCEPTION, ATTENTION AND VIGILANCE

Chair: A. Zani (UniSR, Milan, Italy)

Despite the multifaceted roles played by EEG alpha in perception, attention, and vigilance, many questions remain debated and there is a lack of knowledge on their interactions. Goal of the Symposium is to bridge this lack of knowledge by bringing together a panel of international scholars to contribute elucidating these matters.

How does the alpha rhythm modulate sensory signals, noise, and perceptual decision making?

N. Busch (Westfälische-Wilhelms Universität, Münster, Germany)

How does the ongoing alpha rhythm affect visual perception? Models of perceptual decision-making take into account representations of sensory signals and noise, and offer an explanation of the effect of spontaneous brain activity on perceptual accuracy, decision bias, and subjective appearance of the visual world.

Interpreting oscillations as travelling waves: The role of alpha-band oscillations in cognition

A. Alamia (CNRS, Toulouse, France)

This talk presents three studies that aim to interpret the role of alpha-band oscillations in different cognitive functions, such as visual perception and attention. The key insight of this work is to consider oscillations as travelling waves, arguably a crucial prerequisite to characterize the role of oscillatory dynamics in cognition.

Synchronization of EEG alpha oscillations in cued visuospatial attention is associated with suppression of neural parieto-occipital orienting

A. Zani (UniSR, Milan, Italy)

To investigate whether α -band synchronization in visuospatial attention reflects facilitation or suppression of neural parieto-occipital processing, we computed spatiotemporal-trends of α -band Wavelet CSDA at parieto-occipital and frontal scalp-sites. A higher power was found at right-sided parietal-occipital electrodes in pre- and post-target time-spans for the exogenous than the endogenous condition.

Oscillatory networks of visual attention

D. Pascucci (École Polytechnique Fédérale de Lausanne, Switzerland)

Attention involves brain networks dominated by interactions in the alpha rhythm. Neurotypical and atypical network dynamics remain unclear. I will overview studies on the dynamics of alpha-band networks during anticipatory and reactive attention, focusing on the relationship between the speed of alpha rhythms, attention performance, and visual deficits in schizophrenia.

Reactivity of posterior cortical electroencephalographic alpha rhythms during eyes opening in cognitively intact older adults and patients with dementia due to alzheimer's and lewy body diseases

S. Lopez (Sapienza University of Rome, Italy)

Patients with Lewy Bodies (DLB) and Parkinson's disease dementia (PDD) suffer from vigilance dysregulation. Those patients showed poor reactivity of neural synchronization mechanisms regulating vigilance in response to visual inputs, compared to matched older adults and Alzheimer's disease patients with dementia, as revealed by posterior resting-state electroencephalographic (rsEEG) alpha rhythms.

16:00 - 18:00 *MRO40*

EXPERIENTIAL AND PHYSIOLOGICAL CONSEQUENCES OF SOCIAL PRESENCE AND INTERACTION SETTING

Chair: E. Dan-Glauser (University of Lausanne, Switzerland)

This symposium aims at investigating how experiential and physiological reactivity and regulation are modulated by 1) different configurations of a social settings (such as simple presence or interaction, relationship types, or presence of interaction auxiliary means), and 2) the individual characteristics of the social actors in presence.

Social buffering of parents' presence in a lab-based stress task for preschool children

N. Messerli-Bürky (University of Lausanne, Switzerland)

The phenomenon of social buffering was investigated in preschool children during a lab-based stress task. Results revealed no buffering effect by the presence of a parent, but children showed an extended stress response when separated from parents while the presence of parents improved recovery after the stress task.

Psychophysiological markers buffering the intergenerational transmission of stress

S. Graf (University of Lausanne, Switzerland)

We showed that heart rate variability and performance during a context-encoding and -memory task moderate the link between 1) mother's previous trauma and actual post-traumatic stress symptoms and 2) dysregulation of her infant. This study highlights how psychophysiological markers may help understand the intergenerational transmission of stress.

Touch as a Stress Buffer? Gender Differences in Subjective and Physiological Responses to Partner and Stranger Touch

A. Debrot (University of Lausanne, Switzerland)

The present research shows how gender and level of acquaintance interact to predict how touch buffers experimentally induced stress both at the subjective and physiological level (heart rate frequency and variability).

Interaction as reflected by the dynamics of heart rate synchrony

E. Dan-Glauser (University of Lausanne, Switzerland)

In this research, we supposed that the emotional competences of interacting dyads condition not only their physiological synchrony, but also the synchrony dynamic itself, which in turn is associated with the relationship quality. Time-lagged cross-correlation analyses of three-minute conversations showed profound dynamic differences between dyads with different emotional competence levels.

16:00 - 18:00 *MR160*

CONNECTING MIND AND BODY WITH BIOFEEDBACK: INNOVATIVE AND RIGOROUS APPROACHES TO COGNITIVE ENHANCEMENT

Chairs: L. Bögge (Université Paris Cité, France), S. Chikhi (Université Paris Cité, France), S. Blanchet (Université Paris Cité, France)

In this symposium we will demonstrate the implementation and application of novel biofeedback modalities to strengthen cognitive training outcomes and research rigor. Moreover, we will present results on biofeedback-induced effects on clinically relevant neurological biomarkers and psychophysiological predictions of mental and cerebral states.

Investigation of the link between heart rate variability and cognition using biofeedback

L. Bögge (Université Paris Cité, France)

We will demonstrate the potential of virtual reality HRV biofeedback to improve cognitive control and memory in the healthy population beyond the training period. Moreover, we will present our original attempt to use HRV biofeedback as a stimulation tool to study the relationship between HRV and cognitive processing.

The effect of biofeedback on depressive rumination and its functional correlates in the brain

A. Schumann (Jena University Hospital, Germany)

In this study, we investigated how HRV biofeedback affects functional correlates of depressive rumination in the brain. After biofeedback training for 6 weeks, patients reported a reduction of depressive symptoms including rumination. Brain scans show an attenuated deactivation of regions involved in cognitive control during rumination induction after biofeedback.

Effect of neurofeedback training of theta and high alpha frequency on working memory: A single-blind controlled study

S. Chikhi (Université Paris Cité, France)

Self-regulation of brain activity by neurofeedback could be a technique for cognitive enhancement. We compared the effect of a single training session aimed at increasing theta, high alpha or random frequency amplitudes. Although no specific gains were observed, the resting amplitude of trained frequencies predicted the amplitude increase during training.

How neurofeedback training targeting Theta or Theta + Gamma improves attentional and memory efficiency in an ecological situation using virtual reality

S. Blanchet (Université Paris Cité, France)

We demonstrated in young and healthy adults that neurofeedback training focusing on both Theta and Gamma frequencies improves both attention and temporal contextual information recall during an episodic memory task performed in a relatively ecological situation assessed by virtual reality.

Innovating neurofeedback therapy for ADHD: Beyond the theta/beta protocol?

T. Ros (University of Geneva, Switzerland)

We will present our attempts to translate novel EEG biomarkers of ADHD for closed-loop brain training (also known as neurofeedback). Specifically, we report on the ability of adult patients with ADHD to control alpha rhythms/microstates and their impact on cognitive performance relevant to impulsivity and inattention.

16:00 - 18:00 *MR170*

PSYCHOPHYSIOLOGY OF INTEROCEPTION: NEW METHODOLOGICAL APPROACHES

Chair: E. Georgiou (Ulm University, Germany)

Interoception, defined as the feedback of afferent signals arising from within the body to the brain, and their perception, provides us with vast information regarding body's internal landscape. Therefore, awareness of our body is strongly connected to awareness of ourselves, which is a precondition for normal experience. Although this field of research is vast, there are considerable methodological issues when measuring interoception. Aim of this symposium is to present the newest evidence regarding this field and to shed light into future research.

People with less interoceptive metacognitive skills tend to overestimate their interoceptive awareness

C. Rominger (University of Graz, Austria)

Metacognition of cardiac interoception is an understudied topic and mostly conducted under strongly controlled settings. The present two-study approach assessed interoceptive metacognition in the field, which indicated good between-person reliability. Furthermore, metacognition was negatively associated with interoceptive awareness (i.e., MAIA), suggesting that non-skilled people likely overestimate their cardiac interoceptive awareness.

Modulation of interoception and emotion by high-density transcranial direct current stimulation (HD-tDCS) of the anterior insula

M. Kipping (Ulm University, Germany)

High-density transcranial direct current stimulation was used to examine causal effects of an activation of the anterior insula on interoception and emotion. The expected interoceptive and emotional enhancements were not confirmed. However, results provide limited evidence for a potential relationship between increased activity of the insula and intensified emotion processing.

The comparison of three heartbeat perception tasks

E. Ferentzi (ELTE Eötvös Loránd University, Budapest, Hungary)

Cardiac accuracy is a heavily studied construct, but the operationalization variants is currently the subject of debate. We compared two classical task types (tracking and discrimination) with a new method (n=73). Based on our results, we discuss their similarities and differences, providing directions for future work.

The relationship of the heartbeat-evoked potential (HEP) with interoception and emotion in adolescents

L. Rapp (Ulm University, Germany)

The heartbeat-evoked potential (HEP), a neuronal correlate of the cardiac processing in the brain, is rather unresearched in adolescents. The presented study could positively associate the potential with the performance in a visual emotion recognition task, behavioral problems and the age of minor participants implying maturation effects.

A chatbot-based intervention with ELME to improve stress and health-related parameters in a stressed sample: Study protocol of a randomised controlled trial

C. Schillings (Ulm University, Germany)

The study investigated the effects of a three-week chatbot-based intervention on stress and health-related parameters in a stressed sample. Results revealed reduced stress levels and improved well-being in both the intervention group (n = 59) and the treatment-as-usual control group (n = 59) and increased mindfulness in the intervention group.

SINGLE TALKS

Tuesday, June 27th

09:00 - 10:30 *MR040*

SINGLE TALKS I

Chair: K. Brinkmann

122

Subjective and pupillometric markers of movie experiencing

A. Zuberer (University of Tübingen, Germany)

Time resolved behavioral responses during movie watching have been difficult to map. Here we present work that uses the combination of subjective annotations and pupil size within the same individuals to track individual movie experiencing.

132

Subjective and pupillometric markers of arousal during movie viewing reveal common brain patterns

M. Nanni Zepeda (University of Tübingen, Germany)

We analyzed fMRI data during emotional movie watching, subjective arousal (engagement and disengagement), and continuous pupil size, using GLM contrast design and conjunction analysis. Results reveal across independent data sets that the STS plays a central role in subjective disengagement and its activation levels are further covary with pupil size.

128

Atypical processing of vowels in the left auditory cortex predicts speech-in-noise perception in children with ASD

E. Orekhova (Moscow State University for Psychology and Education, Russian Federation)

Using magnetoencephalography, we have shown that sustained neural responses associated with processing vowel periodicity and formant structure are reduced in children with autism. The reduced left-hemispheric auditory cortex response to formant structure in autism was associated with an impaired ability to benefit from temporal gaps in noise during speech-in-noise recognition.

144

Direct subthalamic nucleus stimulation influences speech and voice quality in Parkinson's disease patients

S. Frühholz (University Of Oslo, Norway)

We show that deep brain stimulation of the subthalamic nucleus can significantly improve speech quality in Parkinson's disease with carefully selected stimulation settings. The effects point to more subtle and differential functional gradients in the subthalamic nucleus organization for motor and speech control.

13:00 - 14:30 *MR030*

SINGLE TALKS II

Chair: M.N. Jarczok

33

Modeling of neurocognitive rehabilitation using intelligent analysis of video streaming and neurophysiological information (EEG, ERPs)

T. Navoenko (Saint Petersburg State Pediatric Medical University, Russian Federation)

For the purpose of human state analysis automation, we estimated the optical flow - the SelFlow convolutional neural network. The approach showed good results for movement detection algorithm (100%), and acceptable results for the respiratory rate with an MAE of 1.75 BPM. The paper discuss video stream and neurophysiology data.

129

A slow paced breathing intervention increases HRV in hospitalized COVID-19-pneumonia patients – secondary results from a clinical randomized controlled trial

M. Jarczok (University medical Center Ulm, Germany)

Neuroimmunomodulation may play a clinical significant role in fighting inflammation. Stimulation of the Vagus nerve reduces inflammation. Hospitalized COVID-19-pneumonia patients (N=21) breathing at 6/min 3x20min daily showed a significant increase in HRV during the breathing intervention compared to resting baseline (DRKS00023971). Slow-paced breathing was shown to be safe and efficient.

53

Data-driven unsupervised EEG clustering on tantric meditation data

E. Mikhaylets (HSE University, Russian Federation)

We present an unsupervised method that detects change-points in EEG time-series. The method was designed to reveal functional traces of consequent meditation stages within lasting tantric meditation recorded in Tibetan Buddhist monks. We propose a robust statistical approach for brain functional states detection tested on real and synthetic data.

49

Heart rate variability is a moderator of treatment outcome for posttraumatic stress disorder: Secondary analyses from a randomised controlled trial

D. Mathersul (Murdoch University, Australia)

Heart rate variability (HRV) was explored as a treatment moderator for posttraumatic stress disorder (PTSD) in a clinical trial comparing Sudarshan kriya yoga (SKY) to cognitive processing therapy (CPT). CPT outperformed SKY for PTSD among Veterans with higher baseline HRV, whereas SKY outperformed CPT among those with lower baseline HRV.

13:00 - 14:30 *MR040*

SINGLE TALKS III

Chair: D. Framorando

42

Assessing the true localization and leakage distortions of MEEG inverse-solutions in real-data employing the low-density pseudo-EEG produced from high-density MEG

A. Areces-Gonzalez (Clinical Hospital of Chengdu Brain Science Institute, China)

Underlying resting-state or standardized task-paradigms are large-scale and dense frequency-specific functional-networks that produce cortical oscillatory activity. MEEG inverse-solutions that target this activity may face severe localization and leakage distortions which blow-up for EEG. Our rationale is to measure distortions regarding a ground-truth that reflects well the physical properties of real-data.

188

$\xi\pi$: A nonparametric model for EEG/MEG power spectra decomposition and quantification

S. Hu (Anhui University, China)

Current models that decompose power spectra are parametric fitting, which may not perform well on the spectra consisting of multiple peaks or irregular shapes. Here, we developed a nonparametric model termed $\xi\pi$ using the shape language modeling. Its superiority to FOOOF was shown on the synthesized, intracranial and sleep EEG.

202

The impacts of preprocessed EEG quality on the fidelity of spectra and functional connectivity

S. Hu (Anhui University, China)

Various EEG preprocessing pipelines were developed for mega-analysis. However, quality assurance is yet fully understood. Here, we simulated the insufficient, proper, and excessive preprocessed data, and evaluated the impacts of improper preprocessing on the fidelity of spectra and functional connectivity. We found the PaLOS index may help with objective preprocessing.

196

The EEG ξ (aperiodic) spectral component, but not the Alpha rhythm, is linear and Gaussian

Y. Wang (University of Electronic Science and Technology of China)

Parametrizing EEG in the spectral domain can extract the skeleton of this stochastic process. We proposed a likelihood-based model for the joint spectrum-bispectrum to parametrize the nonlinearity. With 1772 channels of sEEG data, we found the ξ process is linear and gaussian, but the alpha process is strongly nonlinear

16:00 - 18:30 *MRO40*

SINGLE TALKS IV

Chair: J. Kaiser

96

Individual differences in physiological responses to effortful listening

X. Wang (University of Southampton, United Kingdom)

Understanding speech in poor acoustic environment is challenging and can cause distress in daily life. Through secondary analysis of data obtained in previous experiments, we describe large individual differences in physiological responses to effortful listening. These differences need to be considered when aiming to quantify individual's effort in listening.

152

Bilateral electrodermal asymmetry in competitive tasks

S. Szekeley (Elte Eötvös Loránd University, Hungary)

Our results from experiments using competition to evoke emotional arousal support the Multiple Arousal Theory. Bilateral asymmetry of electrodermal activity in different competitive settings were associated with stress-levels and explanatory styles related to performance. We conclude that bilateral electrodermal asymmetry is a useful and reliable psychophysiological marker of emotional arousal.

66

Human or machine? Detection of negative feedback on driving performance using electrodermal activity and machine learning

Q. Meteier (University of Applied Sciences and Arts of Western Switzerland)

Eighty-two drivers drove in an urban area while receiving repeated negative feedback on their driving performance, either from a machine or a human. Using machine learning on psychophysiological data revealed that recognition of negative feedback yielded an f1-score of 0.92.

125

Appraisal manipulation affects behaviour, physiology and brain representations - a video game study

M. Tan (University Of Geneva, Switzerland)

The nature of emotions is a topic of interest and debate. This study seeks to elucidate whether appraisals affect other components of emotion. We recorded fMRI, physiology and behaviour concomitantly while participants played a video game. We show that changes in appraisal leads to changes in these components.

107

Assessment of the emotional sphere of children with atypical development using the CEDM

E. Lyakso (Saint Petersburg State University, Russian Federation)

The purpose of the study is to compare the emotional sphere of children with typical development, autism spectrum disorders, Down syndrome, and intellectual disabilities using Child Emotional Development Method - CEDM scales. Differences in the scale scores for emotional states manifestation and recognition between four groups of children were revealed.

74

Consolidation of grammatical processing in adolescents: An ERP study of regular and irregular gender inflection in French

G. Blais (Université de Montréal, Canada)

We used event-related brain potentials to compare the processing of French morphosyntactic gender violations between adolescents and adults. Results suggest that the French grammar is not yet fully mature at ages 10–16, and that age differences in acquisition patterns could depend on morphological regularity.

111

Brain mechanisms for affective and neutral conflict processing

J. Kaiser (Ludwig-Maximilians University Munich, Germany)

Cognitive conflicts arise when we have to change prepotent behaviour. It is highly debated if emotional information influence how the brain processes cognitive conflicts. Using fMRI and Dynamic Causal Modelling, we show that conflict processing is primarily driven by the functional relevance of environmental stimuli, not their inherent affective value.

Wednesday, June 28th

09:00 - 10:30 *MR040*

SINGLE TALKS V

Chair: L. Feldmann

46

Frontal alpha asymmetry during emotion regulation in adults with a history of major depression

C. Zsigo (Hospital of the Ludwig-Maximilians-University Munich, Germany)

In an experimental emotion regulation study, we found no differences in frontal alpha asymmetry (FAA) between adults with a history of major depression (histMD) and a healthy control group (HC). However, alpha activity was decreased for the histMD group during the task, indicating greater recruitment of cognitive resources.

200

Microstate fusion across frequency bands alleviates the use of deep learning models for EEG emotion recognition

S. Hu (Anhui University, China)

EEG microstate can decode the transitional spatiotemporal neural dynamics across short intervals. However, the microstate is rarely applied to EEG emotion recognition in the affective computing field. Here, we showed that the microstate fusion across frequency bands can outperform the use of traditional features and two complex deep-learning models.

76

Emotion regulation training for adolescents with major depression: Evidence from an experimental randomized-controlled trial with combined EEG and eye-tracking

L. Feldmann (Hospital of the Ludwig-Maximilians-University Munich, Germany)

This RCT evaluated an emotion regulation training in youths with depression. No effect of the training on stress- or affect-related measures was found. The training lead to an LPP-increase during reappraisal at initial, but not later training sessions. This could represent cognitive effort for task performance, which reduced over sessions.

148

Calm the waves – Emotion regulation using wearable sensor technology

A. Szekely (ELTE Eötvös Loránd University, Hungary)

Well documented training methods and systematic analyses of biofeedback signals used in emotion regulation are scarce. We present methodology and initial results of a large-scale study investigating feasibility, outcome and underlying psychophysiological patterns of a complex, personalized emotion training procedure based on electrodermal activity measurements.

13:00 - 14:30 *MR030*

SINGLE TALKS VI

Chair: H. Nittono

154

Initial neural responses to emotional and neutral stimuli presenting different visual textures

F. Álvarez (Universidad Autonoma de Madrid, Spain)

This study aimed to record the initial neural trace of emotional detection in the visual modality in two stimulus modalities: silhouettes and texturized. While negative silhouettes elicited greater ERP amplitudes than neutral from 40 ms, their texturized or more realistic counterpart did so from 80 ms.

55

Integration of auditory cues for vocal emotion perception – differences between musicians and non-musicians

C. Nussbaum (Friedrich Schiller University Jena, Germany)

We compared vocal emotion perception in musicians and non-musicians, using behavioral and electrophysiological measures. We presented manipulated stimuli that expressed emotional quality through pitch contour or timbre only. Musicians seemed to be particularly tuned to the pitch contour of vocal emotions, presumably due to a natural sensitivity towards melodic patterns.

47

Facial electromyographic responses to infant faces can be modulated by evaluation dimensions

H. Nittono (Osaka University, Japan)

The effect of evaluation dimensions (cuteness vs. beauty) on smiling responses to infant faces was examined by recording facial electromyograms. Cuteness and beauty ratings were highly correlated with each other. Infant faces induced greater smiling responses when viewers rated cuteness rather than beauty.

71

Neural effects of visual typicality and predictability in the visual brain and beyond

L. Ficca (Friedrich-Schiller Universität Jena; Germany)

Based on theories of predictive coding and norm-based perception, we hypothesize that cue-induced predictability and typicality should interact. We measured BOLD signals in thirty five participants to test this hypothesis. While we found only weak evidence for this interaction, the visual brain showed strong sensitivity to typicality

13:00 - 14:30 *MRO40*

SINGLE TALKS VII

Chair: C.M. Gómez

65

Heart rate and heart rate variability: Unaffected by caffeine consumption

S. Leimroth (University of Wollongong, Australia)

Using a double-blind, placebo-controlled, crossover design we examined mean HR and HRV (LF & HF) during eyes-open and eyes-closed epochs approximately 30 and 60 minutes after ingestion of 250 mg of caffeine or a placebo. Consistent with previous research, caffeine had no effect on heart rate or heart rate variability.

194

Integrating semi-analytically and efficiently extended neural mass models with distributed transmission delays

A. González Mitjans (University of Electronic Science and Technology of China)

We propose a novel and efficient way to semi-analytic integrate Neural Mass Models. We introduce a distributed-delay Connectome Tensor allowing, for the first time, encoding distributed transmission delays between neural masses. An open-source toolbox with fundamental algorithms for enhancing brain simulation and allowing more comprehensive and realistic modeling is presented.

140

The studying of simulator sickness brain mechanisms in virtual reality using eye movements parameters

A. Kovalev (Lomonosov Moscow State University, Russian Federation)

In this study the brain mechanisms of simulator sickness in virtual reality were investigated. Using the optokinetic nystagmus parameters there was obtained the changing in brain activity in parietal and occipital regions during the simulator sickness occurrence.

204

Role of negative feedback in EEG and peripheral systems

C. Gómez (University of Sevilla, Spain)

Present communication tries to prove the negative feedback mechanism in two different psychophysiological mechanisms: (i) The oscillatory frequency bursts duration in the EEG, and (ii) the control of heart rate in the sinus arrhythmia.

Thursday, June 29th

09:00 - 10:30 *MR040*

SINGLE TALKS VIII

Chair: C. Scarampi

149

Muscarinic acetylcholine receptor antagonism attenuates sensitivity to learned values in value-based decision making

E. Ort (Heinrich Heine University Düsseldorf, Germany)

When making decisions between options based on their subjective values, these values must oftentimes be learned from experience before informing a decision. In a psychopharmacological study, we showed that blockade of muscarinic acetylcholine receptors in healthy humans impairs the integration of reinforcement history to guide subsequent choices.

163

GABAergic and glutamatergic control of perceptual versus value-based decisions

M. Froböse (Heinrich Heine University, Germany)

We make decisions on a daily basis, some are about perceptual information, others are about expected reward values. Here, we pharmacologically manipulated activity at either GABA or glutamatergic NMDA receptors in a healthy sample and, using computational models, revealed differential contributions of each manipulation to these two types of decisions.

138

Increasing large-scale beta-synchronization during the second day of pseudoword-movement associative learning

A. Razorenova (Moscow State University, Russian Federation)

Associative rule learning was accompanied by the MEG-recorded large-scale β -event-related synchronization over the associative cortical regions, which appeared only when the rules were learned, and, without fading in strength after a night's sleep, followed the errorless task performance over the second day of mastering the same task.

175

Psychophysiology of prospective memory: The role of interoception

C. Scarampi (University Of Geneva, Switzerland)

In our everyday life, we form several intentions which can only be executed after a delay – i.e., prospective memory (PM). The study aims to investigate if the initiation of intention retrieval is triggered by changes in bodily states and better interoceptive abilities are associated with better PM performance.

13:00 - 14:30 *MR040*

SINGLE TALKS IX

Chair: S. Fischer

195

Electrophysiological markers of fatigue due to daylong exertion of cognitive control

S. Naik (Sorbonne Université, France)

Previously, we demonstrated that continuous exertion of cognitive control at the time scale of a typical workday impacts economic decisions. Here, using high-density electroencephalography (EEG), we show that this choice impulsivity related to cognitive fatigue is negatively correlated to low-frequency power over left-frontal electrodes measured during decision making.

193

A Riemannian Geometry perspective on EEG functional connectivity as a mediator between malnutrition and cognition

C. Lopez Naranjo (University of Electronic Science and Technology of China)

This work presents methods to perform Riemannian mediation analysis where the Mediator is a cross-spectral EEG object belonging to a Manifold. The procedures are validated through simulations and tested using the Barbados Nutrition Study dataset to evaluate the effects of malnutrition on cognition during the first year of life.

Psychobiological correlates of gender and sexual minority stress – Findings from the Swiss LGBTIQ+ panel

S. Fischer (University of Zurich, Switzerland)

Gender and sexual minorities are at an increased risk of stigma and discrimination. This study investigated mental health and hair cortisol concentrations in n=330 LGBTIQ+ people and n=284 cis-gender heterosexuals. Gender minorities had higher levels of depression and anxiety and lower hair cortisol, a profile seen in trauma-related conditions.

POSTERS SESSIONS

Poster session 1

First Name	Last Name	Poster n°	First Name	Last Name	Poster n°
Julia	Bessonova*	150	Sara	Scrimin	20
Wendy	Birmingham*	40	Andrea	Schittenhelm	23
Izabela	Chataatkiewicz*	95	Andreas	Schwerdtfeger	86
Julia	Ditzer*	13	Hiroaki	Shoji	135
Lucas	De Zorzi	69	Yuta	Sobue	99
Alena	Glazkova*	124	Rúben	Sousa*	56
Carlos Maria	Gómez*	206	Anastasia	Sukmanova	159
Bahar	Güntekin	59	Yu	Sumiya	119
Anastasia	Kovaleva*	10	Kei	Tabaru	94
Mariana	Linharelhos	58	Josef	Tatschl	130
Jing	Lu*	176	Aline	Tiemann	72
Daniela	Mannarelli*	82	Joseph	Ciorciari	15
Aleksei	Mekler	108	Serhii	Tukaiev	146
Nick	Menger	110	Daisuke	Ueno	102
Sofia	Mironets*	187	Zehra	Ülgen	115
Keita	Mizuhara	35	Arianna	Vecchio	64
Nana	Morishita	61	Verena	Wuellhorst	103
Sven	Mueller	38	Weilong	Xiao	87
Elena	Orekhova	89	Keiko	Yamazaki	101
Maria	Papaliagka	92	Shahwar	Yasir	199
Caterina	Pauletti*	83	Ebru	Yildirim	113
Yuri	Pavlov*	28	Lin	Yu	160
Lena	Peter	2/8	Shu	Yu	180
Sofia	Polevaia*	44	Chenqi	Zhang	172
Kristina	Pultsina	116	Lang	Zhang	178
Laura	Riontino	158	Dian	Zhu	22
Alexander	Savostyanov	39			

* appear in both session 1 and 2

Poster session 2

First Name	Last Name	Poster n°	First Name	Last Name	Poster n°
Agnieszka	Adamczyk	139	Tsubasa	Izaki	123
Timofey	Adamovich	68	Thomas	Jacquet	104
Cédric	Albinet	48	Ketevan	Janashia	32
Ariosky	Areces-Gonzalez	41	Marc N.	Jarczok	155
Alexander	Ariu	73	Jeanne	Rudy	117
Julia	Bessonova*	120	Jürgen	Kayser	121
Wendy	Birmingham*	78	Motohiro	Kimura	97
Maria Antonieta	Bobes Leon	197	Sandra	Klonteig	24
Izabela	Chałatkiewicz*	156	Artem	Kovalev	142
Qinyuan	Chen	105	Anastasia	Kovaleva*	114
Enguang	Chen	18	Tobias Robin	Kurz	147
Ana	Chikviladze	67	Alice	Lagacy	80
Jennifer	Christensen	203	Geying	Liang	177
Rita	Cosoli	75	Yunhong	Liu	179
Jente	Depoorter	37	Jing	Lu*	207
Raoul	Dieterich	157	Daniela	Mannarelli*	81
Julia	Ditzer*	9	Nedjma	Mansouri	141
Amandine	Franzoni	70	Mila	Marinova	21
Akifumi	Fukushima	127	Sofia	Mironets*	151
Alena	Glazkova	134	Koichiro	Miyaji	77
Carlos Maria	Gómez*	205	Caterina	Pauletti*	84
Marie	Gomot	79	Yuri	Pavlov*	26
Anna	Gorbacheva	31	Sofia	Polevaia*	45
Lucile	Guillermier	106	Rúben	Sousa*	57
Amélie	Guyon	112	Claudia	Traunmüller	29
Roeland	Heerema	198	Yan	Yu	98
Keito	Hishikawa	100	Renlai	Zhou	181
Kai	Ishida	62			

POSTERS

2 - *Poster session 1*

Negative impact of the pandemic on maternal and child health, considering maternal experiences of abuse and neglect in childhood

L. Peter (University Hospital of Ulm, Germany)

The aim was to analyse the interaction between maternal-CM, maternal-pG and children's-kW during the pandemic. Our mediation analysis showed a significant positive association between the extent of maternal-CM experiences, mothers' psychosomatic symptoms and their children's kW. Maternal psychosomatic symptoms significantly mediate the interaction between-CM and children's-kW.

8 - *Poster session 1*

Mothers' daily perception of stress influences their children's mental health during the SARS-CoV-2 pandemic - an online survey

L. Peter (University Hospital of Ulm, Germany)

The aim of the study is to investigate the role of mothers' perceived-daily-stress on children's-mental-health during the pandemic. We found a positive, significant effect of mothers' perceived-daily-stress on children's-emotional-problems during the pandemic. In addition, the results provide empirical evidence for an increase in children's-hyperactivity-levels as a function of perceived-maternal-stress.

9 - *Poster session 2*

The experience of bearing a child: Implications for body boundaries and their link to preterm birth

J. Ditzer (Stanford University, United States)

Preterm birth is the leading cause of infant death and mortality in children under five. Unfortunately, its multifaceted causes are not fully understood. One determinant of women's transition to motherhood is body boundaries, separating the self from the "not self." This study examines its role in predicting preterm birth.

10 - *Poster session 1*

HRV during watching short scary video in VR and on screen in students with different subjective rating of content valence

A. Kovaleva (P.K. Anokhin Research Institute Of Normal Physiology, Russian Federation)

The study aimed to reveal HRV indicators that change when watching scary video in VR and on screen in relation to the subjective assessment of the content valence. More positive ratings were given by participants with greater HRV and lower sympathetic activity according to the time domain and nonlinear analysis.

13 - *Poster session 1*

"Do I still exist?": The role of childhood maltreatment in self-recognition

J. Ditzer (Stanford University, United States)

Childhood maltreatment can disrupt self development and self-perception. Still, existing literature has rarely investigated the early psychological factors that contribute to self-perception in adulthood, especially regarding facial recognition of the self. Our study highlights the self's role in facial recognition and suggests connections between childhood maltreatment and self-recognition ability.

15 - *Poster session 1*

Evidence of learning within a yoked sham neurofeedback group

J. Ciocriari (Swinburne University Of Technology, Australia)

Many studies report negligible effects in sham neurofeedback (NF) groups; however, limited empirical work implements active sham-NF training. This study explores an active yoked sham EEG-NF session that was administered to 11 participants as part of a 3-arm study. Evidence of learning is observed in three participants via linear regression.

18 - *Poster session 2*

Configural and featural face processing influence the attentional capture of face race: Evidence from N2pc

E. Chen (Shandong Normal University, China)

The present study found that other-race faces capture more attention in crowd and further demonstrated that configural processing played a greater role in the recognition of own-race faces, while featural processing played a greater role in recognizing other-race faces from the perspective of attentional capture.

20 - *Poster session 1*

Moderate cardiac vagal tone promotes cooperation among highly sensitive individuals

S. Scrimin (University Of Padova, Italy)

Our aim was to assess the association between cooperation, cardiac vagal tone at rest (CVT), as a correlate of self-regulation, and environmental sensitivity (ES). A quadratic relationship between CVT and cooperation emerged. Among highly sensitive individuals, moderate physiological regulation was associated with more cooperative behaviors than low and high self-regulation.

21 - *Poster session 2*

The brain on numbers: Investigating numerical format integration in children and adults using frequency tagged EEG

M. Marinova (University Of Luxembourg, Luxembourg)

The neurocognitive signatures of fundamental math skills are debated. We used an oddball frequency-tagged EEG technique to examine the relationship between different numerical formats (digits, words, dots) in children (7 -12 years) and adults. The results showed significant oddball responses with varying strength according to condition and age.

22 - *Poster session 1*

Investigating the effect of gamified mindfulness intervention on hyperactivity disorder tendency of attention deficit hyperactivity disorder children

D. Zhu (Shanghai Jiao Tong University, China)

This research aims to understand the effects of a gamified mindfulness intervention on hyperactivity disorder tendency of ADHD children. Results showed a statistically significant difference in the intervention group. Therefore, gamification is capable of optimizing the effect of the conventional mindfulness intervention on the hyperactivity disorder tendency of ADHD Children.

23 - *Poster session 1*

Concurrent training improved cognitive performance of medical emergency personnel after 12 weeks

A. Schittenhelm (University of the Bundeswehr Munich, Germany)

Sport positively impacts i.a. the cardiorespiratory system, stress, and mental well-being. In this study, we tested the effects of a twelve-week sports intervention on (a) resuscitation performance, (b) cognitive performance, and (c) recovery of N=9 medical first responders. We found that sport could improve cognitive performance before and after stress.

24 - *Poster session 2*

Paying attention to attentional bias: Comparing EEG, fNIRS, eye-tracking and behavioral measures of attentional bias - A pilot study

S. Klonteig (Oslo Metropolitan University, Norway)

The current study is addressing a candidate mechanism involved in symptom improvement in depression and anxiety; changes in attentional bias (AB). Here, we compare measurements of AB from several modalities (fNIRS, EEG, eye tracking, behavior), with the aim to optimize the conditions for measuring and manipulating AB.

26 - *Poster session 2*

Neural signatures of contingency awareness

Y. Pavlov (University of Tübingen, Germany)

In a semantic conditioning experiment, we showed that associative learning cannot occur without contingency awareness. Contingency awareness depended on personality traits, and was indexed by generally amplified neural patterns reflecting expectation of an aversive event and informative cues, as well as violation and confirmation of the expectation.

28 - *Poster session 1*

Detecting cognitive overload state from pupil size and oscillatory brain activity

Y. Pavlov (University of Tübingen, Germany)

We investigated how exceeding individual working memory capacity limit affects psychophysiological indicators such as frontal midline theta, posterior alpha, and pupil size. The cognitive overload state (indicated by behavioral outcomes) lead to a saturation but not to an immediate drop or surge in the physiological indexes of working memory load.

29 - *Poster session 2*

SleepECG: A Python package for sleep staging based on heart rate variability

C. Traunmüller (University Of Graz, Austria)

SleepECG is an open-source Python package for sleep staging based on heart rate variability. It includes functions for downloading and importing polysomnography datasets, detecting heartbeats, and classifying sleep stages, as well as classifiers pre-trained on thousands of labeled records. SleepECG thus enables a fully open and reproducible sleep staging analysis.

31 - *Poster session 2*

To the problem of intersystem correlations: Anxiety by Spielberg, EEG asymmetry, somatic dollchomorphy

A. Gorbacheva (Lomonosov Moscow State University, Russian Federation)

The analysis of the morphophysiological basis of anxiety by Spielberg, accomplished for the sample of 111 students, allowed to fix that the higher level of the anxiety for females is associated with negative coefficient asymmetry of EEG, while for males — with higher EEG power and dolychomorphy of body proportions.

32 - *Poster session 2*

Baseline high cardiac vagal tone in healthy males provides better adaptation to high geomagnetic activity

A. Ramishvili (David Tvildiani Medical University, Georgia)

The baseline high Cardiac vagal tone (CVT) compared with low CVT provides the optimal adaptation reaction of healthy males to protect them from high geomagnetic activity in the main phase of geomagnetic storms manifesting reduced heart rate and increased heart rate variability.

35 - *Poster session 1*

Breathing in through the nose facilitates discrimination of emotional facial expressions

K. Mizuhara (Osaka University, Japan)

This study demonstrated that the discrimination accuracy between subdued fearful expressions and neutral expressions was higher during nasal inhalation than during nasal exhalation. However, event-related potentials elicited by the stimuli during the discrimination task did not differ between the respiration phases.

37 - *Poster session 2*

Spontaneous emotion regulation after experimental stress induction: The effect on physiological stress recovery

J. Depoorter (Ghent University, Belgium)

Difficulties regulating undesired affective states are considered an important transdiagnostic risk factor. This study investigates (a) which emotion regulation strategies individuals spontaneously use upon confrontation with a standardized psychosocial stressor, and (b) whether specific sequences of emotion regulation strategy use influence physiological stress recovery.

38 - *Poster session 1*

The influence of menopause on mental health and emotion perception: An eye tracking study

S. Mueller (Utrecht University, The Netherlands)

Whereas the consequences of menopause on mental health and wellbeing on women are known, few studies have examined experimentally the relationship between affective processing and mental health in this cohort. This study examined affective processing using eye tracking and found reduced attention to emotional faces with higher menopausal symptoms.

39 - *Poster session 1*

EEG reactions under recognition of emotional sentences about self- and others as the markers of inclination to depression

A. Savostyanov (Scientific-Research Institute of Neurosciences and Medicine, Russian Federation)

The aim was to identify markers of depression through analysis of EEG reactions on the emotional sentences about the subject or other people. Dataset from 870 non-clinical subjects was collected. The severity of depression was assessed using the Beck Depression Inventory. The correlations between BDI scores and theta-synchronization were revealed.

40 - *Poster session 1*

Friends and families: The effect of network support on nocturnal blood pressure dipping

A. Jorgensen (Brigham Young University, United States)

Research shows social support reduces stress and blood pressure. Blood pressure should dip 10-15% overnight, and dipping is more predictive of cardiovascular disease risk than either daily or nighttime measures. We examined dipping and social support in 179 individuals and found that a supportive network is associated with healthy dipping

41 - *Poster session 2*

Multilayer electrophysiological source imaging

A. Areces-Gonzalez (Clinical Hospital of Chengdu Brain Science Institute, China)

Layered/columnar architecture of the neocortex is the key to delivering higher-order brain functions. We aim to estimate the columnar dynamics by introducing a Multilayer Electrophysiological Source Imaging (MESI) pipeline, employing source models defined from a segmentation of the BigBrain histological space into seven boundaries that enclose the six columnar layers.

44 - *Poster session 1*

Unique cardiac rhythm abnormalities in COVID-19 patients

S. Polevaia (Lobachevsky State University, Russian Federation)

High-precision cardiointervalography based on heart rate telemetry made it possible to reveal specific rhythm anomalies – so-called cardiospikes – in the rhythmograms of COVID-19 patients. Telemetry data verification via a standard electrocardiograph indicates the invariance of this phenomenon to recording devices.

45 - *Poster session 2*

Comparative study of light and music stimulation controlled by one's own or by others' biopotentials of the brain and heart

S. Polevaia (Lobachevsky State University, Russian Federation)

The effects observed when subjects are presented with light and music influences controlled by their own or by others' biopotentials of the brain and heart have been compared. Only with stimulation controlled by the subjects' own biopotentials, there was an increase in the power of the main EEG rhythms.

48 - *Poster session 2*

Inhibitory control and cardiac pre-ejection period in young and middle-aged adults

C. Albinet (INU Champollion, France)

This study examined cognitive performance and cardiac pre-ejection period (PEP) in young and middle-aged adults. Variants of a flanker task involved different levels of inhibition control. For both groups, PEP reactivity was significant only during the first minute of each experimental task, going back to baseline level afterward.

56 - *Poster session 1*

Changes in young offenders' HRV patterns after the delivery of the PSYCHOPATHY.COMP program

R. Sousa (University of Coimbra, Portugal)

The PSYCHOPATHY.COMP, a compassion-based intervention program for young offenders, was tested and its efficacy assessed through self-report and physiological measures. Treatment participants presented decreases in difficulties in emotion regulation and more adaptive recovery from emotional stimuli than controls. Findings support future use of physiological measures as treatment efficacy indexes.

57 - *Poster session 2*

Different types of offending: Evidence for HRV-based profiles in young offenders

R. Sousa (University of Coimbra, Portugal)

This research supports four different physiologically-based (i.e., HRV) classes of young offenders. In line with literature, increased HRV associated with better scores in self-reported measures of interest. However, the class with the lowest HRV showed similar results. Findings support the need for in-depth analysis of HRV within offending behavior.

58 - *Poster session 1*

Physiological correlates of the tripartite model of affect regulation: HRV differences between community and forensic male adolescents

M. Linharelhos (University of Coimbra, Portugal)

HRV patterns across the triggering of the threat, drive, and soothing systems were compared between young offenders and their normative peers. Differences between groups in emotion regulation patterns emerged at the self-reported and physiological level regarding the soothing system, which inform conceptualizations and future interventions for young offenders with CD.

59 - *Poster session 1*

Event-related brain oscillatory responses topographically differentiated between visual and auditory emotional stimuli

B. Güntekin (Istanbul Medipol University, Turkey)

Emotional pictures and sounds were used to evaluate the modality-specific effect of emotional stimuli (i.e., visual and auditory) on EEG-brain oscillations. The results showed that emotional stimuli presented in different modalities cause selectively-distributed delta and theta brain responses over differentiated brain regions with higher responses for the visual emotional stimuli.

61 - *Poster session 1*

Previous virtual reality experiences impact cortical oscillations during rubber hand illusion in virtual reality environment

N. Morishita (National Institute of Advanced Industrial Science and Technology, Japan)

We examined how previous Virtual Reality (VR) experiences affect when participants experienced bodily illusion in VR environment using EEG and rubber hand illusion paradigm (RHI). The result implied that cortical oscillation related to RHI tended to appear in earlier time period in participants with VR experiences compared to VR novice.

62 - *Poster session 2*

Statistical learning of artificial chord transition rules does not produce a deviance-related negativity in a different auditory context

K. Ishida (Graduate School of Human Sciences, Japan)

The present study examined whether an event-related potential like the early right anterior negativity (ERAN) occurred when artificial chord transition rules were acquired by statistical learning. No ERAN-like response was observed even when the participants became capable of choosing the regular chord transition from the irregular chord transition.

64 - *Poster session 1*

Electrocortical correlates of situational empathy pain

V. De Pascalis (Sapienza University of Rome, Italy)

The results of this study describe the empathic response as a situational, cognitively complex process based on two cognitive processes, the identification of emotions, and affective sharing, related to the recognition of the emotional state of the other in the self.

67 - *Poster session 2*

An experimental study of mental chronometry among healthy medical students, using a virtual model for assessing the decision-making process

A. Chikviladze (David Tvildiani Medical University, Georgia)

The first-year healthy male medical students compared to second-year students showed the worst parameters of mental chronometry, which relates to the lousy adaptation to new environments that negatively affect their ability to perform the decision-making process appropriately.

68 - *Poster session 2*

The neural correlates of congruent and incongruent arithmetic word problems

T. Adamovich (Psychological Institute of the Russian Academy of Education, Russian Federation)

In this study the neural correlates of congruent and incongruent two-digit arithmetic word problems were identified using functional near-infrared spectroscopy. Significant activation was found in the frontal, parietal and temporal brain regions. The obtained results are discussed in terms of high cognitive load associated with semantic and phonological text processing.

69 - *Poster session 1*

The impact of attention bias modification training on behavioral and physiological responses

L. De Zorzi (University of Lille, France)

This study examined the impact of attention bias modification on behavioral and autonomic reactivity. Fifty-eight participants were divided into a training group and a control group while eye movements and electrodermal responses were recorded. Trained participants were slower to orientate to unpleasant images and showed attenuated SCRs to unpleasant images.

70 - *Poster session 2*

Are stress biomarkers related to emotional eating in preschool children?

A. Franzoni (University of Lausanne, Switzerland)

To which extent stress biomarkers are related to more emotional eating was investigated in a sample of 511 preschoolers. Analyses revealed an association between diurnal salivary alpha amylase and emotional eating, but none between diurnal cortisol or vagal tone and emotional eating.

72 - *Poster session 1*

Dimensions of cardiac and gastric interoception and their association with disordered eating

A. Tiemann (University of Fribourg, Switzerland)

This study examines the relation of different dimensions of cardiac and gastric interoception with disordered eating. Preliminary results indicate that physiological measures of gastric activity and self-reported gastric interoception were significantly associated with emotional eating. These insights have implications for novel, targeted training interventions in this field.

73 - *Poster session 2*

Are sleep problems related to cortisol awakening responses in preschool-aged children?

A. Ariu (University of Lausanne, Switzerland)

Sleep problems are related to diurnal cortisol levels in older children, but their potential relationship has not been investigated in preschool-aged children. Results revealed that bedtime resistance and sleep onset delay were related to higher cortisol awakening response (CAR) which might represent an increased vulnerability for long-term mental health problems.

75 - *Poster session 2*

Does looking at a 360° video elicit stress-related psycho-physiological activation? A case in emergency professions

R. Cosoli (Swiss Federal University for Vocational Education and Training, Switzerland)

This study compares an emergency simulation performed by apprentices with a simulation observed through a 360° immersive video to highlight whether psycho-physiological activation in these conditions is comparable. The results confirmed that the participants' cortisol levels, perceived arousal and stress do not differ significantly in the two conditions.

77 - *Poster session 2*

Basic research on voice training game application for children with severe multiple disabilities: By the phasic heart rate responses

K. Miyaji (Shinshu University, China)

We investigated the relationship between attention to game and the phasic heart rate responses as basic research on the vocal training game application for children with severe multiple disabilities. Attention to the visual effects and vocalizations on this game application may have evoked the expectancy response.

78 - *Poster session 2*

Differences matter: Blood pressure in students of color on a predominately white campus

W. Birmingham (Brigham Young University, United States)

College can be a stressful transition. Students of color may experience greater stress and less social support when attending a predominately white campus. This stress may be demonstrated in higher blood pressure. We looked at such students and found higher blood pressure and lower supportive network ties.

79 - *Poster session 2*

Faster neural adaptation to neutral than to emotional prosodic sounds

M. Gomot (University of Tours, France)

Neural adaptation to vocal (neutral and emotional) and non-vocal sounds was compared by recording ERPs during a roving paradigm. Results showed different dynamics for regularity encoding according to the nature of the sounds, with slower adaptation to sounds involving emotional prosody than to neutral and non-vocal sounds.

80 - *Poster session 2*

Modification of attentional biases towards emotional information: Behavioral and autonomic approaches

A. Lagacy (University of Lille, France)

This double-blind randomized controlled trial investigates the impact of an attentional bias modification treatment on physiology. 132 participants, assigned to a training or control group, performed a dot-probe task using emotional facial expressions while their physiological parameters were recorded. The training condition aims to enhance attention to joyful expressions.

81 - *Poster session 2*

Cerebellum and timing: Evidence from a contingent negative variation study

D. Mannarelli (Sapienza University of Rome, Italy)

Cerebellar inhibition selectively altered the ability to make time estimations for second or sub-second interval timing. We argue that cerebellum regulates the attentional processing of timing control both directly, by making predictions of interval timing, and indirectly by controlling the functioning of brain cortical areas involved in timing perception.

82 - *Poster session 1*

Body-related stimuli influence the attentional processing in patients with anorexia nervosa: Evidence from a contingent negative variation pilot study

D. Mannarelli (Sapienza University of Rome, Italy)

The processing of body stimuli determines an enhancement of the alerting state, without improving the performance. This psychophysiological pattern is similar to the one following the presentation of food possibly indicating that the overactivity in anticipatory attention is probably linked to an emotional bias rather than to the stimulus significance.

83 - *Poster session 1*

Attention network efficiency in multiple sclerosis with central fatigue: Evidence from the attention network test

C. Pauletti (Sapienza University of Rome, Italy)

Central fatigue in multiple sclerosis seems to be related to a significantly higher cost being paid for ignoring conflicting information during the attention network test leading to a worse executive network efficiency. Our data support the hypothesis that a dysfunction in the thalamo-striato-prefrontal network may be involved in its pathophysiology.

84 - *Poster session 2*

Novelty processing in multiple sclerosis with central fatigue: Data from ERPs

C. Pauletti (Sapienza University of Rome, Italy)

Central fatigue in multiple sclerosis is selectively associated to a more conspicuous amount of attentional resources requested to discriminate novel stimuli in an adequate time interval, probably indicating a compensatory activity in the bottom-up attentional control mechanism.

86 - *Poster session 1*

The real-time application of an additional HRV reduction algorithm to detect negative psychosocial states in real-time: Are we ready yet?

A. Schwerdtfeger (University of Graz, Austria)

Additional (i.e., non-metabolic) reductions in heart rate variability (AddHRVr) are assumed to index episodes of psychosocial vulnerability in everyday life. We examined whether a real-time algorithm to detect such AddHRVr could predict higher stress, perseverative cognition, or low quality-social interactions across 5 days. Hypotheses could not be confirmed.

87 - *Poster session 1*

Thinking style influences moral decision-making under harm dilemmas: An fNIRS study

W. Xiao (Zhejiang Normal University, China)

We combined functional near-infrared spectroscopy and CNI model to examine the impact of thinking style on moral decision-making. We found that thinking style influences moral decision-making under harm dilemmas and the dorsolateral prefrontal cortex might serve as the neural basis for the influence of analytical thinking on outcome sensitivity.

89 - *Poster session 1*

The aperiodic slope of the MEG spectrum reflects an increase in inhibition, but only when measured in the high-frequency range

E. Orekhova (Moscow State University for Psychology and Education, Russian Federation)

It is assumed that the aperiodic spectral slope of the MEG/EEG reflects the neural excitation-to-inhibition ratio. We found that functional changes in neural inhibition are reflected in the slope estimated at 30-45Hz, but not at 2-40Hz. The results urge caution when interpreting aperiodic slope estimated over a wide frequency range.

92 - *Poster session 1*

Association of paraxanthine serum levels with PANSS in patients with schizophrenia

M. Janho (University of Thessaly, Greece)

The clinical characteristics of patients with schizophrenia (n=38) were correlated with the serum caffeine metabolite paraxanthine. High paraxanthine levels were associated with lower values of the Negative and higher values of the Positive and General Psychopathology PANSS score. High caffeine consumption may affect the clinical status of patients with schizophrenia.

94 - *Poster session 1*

Tonal processing in major and minor chord contexts: An ERP study

K. Tabaru (Ibaraki University, Japan)

Previous studies have reported that musical-syntactic irregular chords elicit early right anterior negativity (ERAN). We examined the ERAN elicited for major and minor chord contexts. ERANs were confirmed in both tonality conditions, and the amplitude in the minor chord context was significantly larger than that in the major chord context.

95 - *Poster session 1*

The relationship between social anxiety and empathic reaction to pain:

Psychophysiological perspective

I. Chatatkiewicz (SWPS University, Poland)

The study revealed a relationship between social anxiety and empathic reaction to pain. High social anxiety was related to higher level of emotional empathy for pain and stronger activity of orbicularis oculi and corrugator supercilii, indicating that people with social anxiety strongly resonate emotionally with the pain of others.

97 - *Poster session 2*

Effects of artifact-reduction methods on the required EEG data length for evaluating mental workload with an auditory probe ERP technique

M. Kimura (National Institute of Advanced Industrial Science and Technology, Japan)

Effects of six artifact-reduction methods on the EEG data length required for evaluating mental workload with ERPs elicited by task-irrelevant auditory probes were examined. Dramatic difference among these methods was not shown.

98 - *Poster session 2*

The neurophysiology of music processing in teenagers with different bilingual backgrounds

Y. Yu (St. John's University, United States)

Understanding whether and how early bilingual experience modulates cortical sensitivity to music processing has both theoretical and clinical implications. We measured cortical responses of music processing in bilingual English-Mandarin (tonal language) and English-Spanish (nontonal language) teenagers. We found that English-Mandarin teenagers showed larger discriminative responses to different music changes.

99 - *Poster session 1*

Event-related potentials induced by robotically-controlled affective touch

Y. Sobue (National Institute of Advanced Industrial Science and Technology, Japan)

In cognitive neuroscience, visual and auditory stimuli have been often used to study human emotions although tactile stimuli also have an important role to induce various emotions. The present study demonstrated that positive and negative emotions caused by robotically-controlled affective touch induced different ERP waveforms.

100 - *Poster session 2*

Mismatch negativity study of auditory discrimination in the front-back space

K. Hishikawa (Graduate School of Humanities and Social Sciences, Japan)

We investigated the discrimination process between front-back auditory spatial localization discriminating and non-discriminating groups. We used event-related brain potentials' mismatch negativity (MMN) that reflects deviance detection. The MMN results showed that both groups could detect the auditory deviation that depends on the sensory memory trace of previous patterns.

101 - *Poster session 1*

Mobile phone usage of early adolescent and event-related brain potentials during Go/NoGo task: The Hokkaido study

K. Yamazaki (Hokkaido University, Japan)

Event-related potentials (ERPs) of 96 adolescents were recorded during Go/NoGo task. Some of mobile phone usage (calls, gaming etc.) were associated with prolonged Go P3 latency and decreased amplitudes of Go and NoGo P3. Unlikely to be related to electromagnetic exposure, mobile phone use may be associated with cognitive processes.

102 - *Poster session 1*

Brain functional connectivity related to the interoceptive improvement in older patients with somatic symptom disorders: A pilot resting-state fMRI study

D. Ueno (Kyoto Prefectural University of Medicine, Japan)

This study investigating the correlation between interoception and resting-state brain functional connectivity in older patients with somatic symptom disorder (SSD) identified interoceptive improvement associated with a negative correlation between the left insular cortex and cerebellar vermis 9. Implications of the relationship in older patients with SSD are discussed.

103 - *Poster session 1*

Using event-related potentials to differentiate facets of impulsivity

V. Wuellhorst (Technische Universität Dresden, Germany)

We investigated event-related potentials of response inhibition in a stop-signal task to disentangle facets of impulsivity in a sample of $N = 233$. Whereas reduced P3 amplitudes were associated with both poor inhibition and high urgency, an increased P1 amplitude and shorter P3 peak latencies were specific for high urgency.

104 - *Poster session 2*

Electrophysiological changes associated with acute smartphone use and mental fatigue

T. Jacquet (Université de Bourgogne, France)

Acute smartphone use induces mental fatigue, leading to an increase in feelings of fatigue and sleepiness, as well as a decrease in attentional performance. Changes in brain activity and heart rate variability may indicate the presence of mental fatigue, but they could also be caused by the increase in sleepiness.

105 - *Poster session 2*

Dynamic causal modelling to index effective connectivity changes when dealing with criticism in adolescents

Q. Chen (Ghent University, Belgium)

Exposure to criticism lead to negative affect and increased ruminative thoughts. Using dynamic causal modeling, we found that adolescents may use cognitive control mechanisms to counter ruminative thoughts when they are being criticized. Adolescents who ruminate more after being criticized received less modulatory effect of criticism in the sgACC-to-DLPFC connectivity.

106 - *Poster session 2*

Is Non-Rapid Eye Movement (NREM) sleep involved in the regulation of negative emotions induced by viewing an aversive movie?

L. Guillemier (University of Savoie Mont Blanc, France)

While NREM is involved in various cognitive functions, little is known about its involvement in emotional regulation. We investigated whether NREM contributes in the (re-)processing of emotional experiences. We found that the extent of emotional attenuation over sleep was related to changes in NREM parameters (e.g., spindle amplitude).

108 - *Poster session 1*

The effect of metronome beat of various rates on the complexity of the brain electrical activity

A. Mekler (Saint-Petersburg State Pediatric Medical University, Russian Federation)

Our EEG study results showed that the rhythmic acoustical stimulation (metronome) leads to increase in the measured brain processes complexity (we used correlation dimension of reconstructed attractor (D2) and Lempel-Ziv complexity) independently of the beat rate and its pleasantness. Study was supported by the RFBR grant 14-06-00248.

110 - *Poster session 1*

The role of conscious awareness in olfactory conditioning

N. Menger (University of Tübingen, Germany)

This study examines the neurophysiological processes involved in appetitive and aversive conditioning. The results suggest that effects are stronger in participants who are consciously aware of the associations, but even in these aware participants, the effects are only minimal.

112 - *Poster session 2*

Music performance anxiety and audience presence: Their influence on the music students' neuroendocrine response across time during a music performance

A. Guyon (Unisanté, Switzerland)

Investigation of how university music students' general MPA level (i.e., the general tendency to experience anxiety during solo music performances), audience presence, and time influence the sympathetic-adrenal-medullary (SAM) system and the hypothalamic-pituitary-adrenal (HPA) axis activity before, during and after a private and a public music performance.

113 - *Poster session 1*

Event-related alpha and beta phase-locking decreased in DLB and PDD compared to ADD during the visual oddball task

E. Yildirim (Istanbul Medipol University, Turkey)

The present study investigated the alpha-beta EROs during the visual oddball task in patients with Alzheimer's disease dementia (ADD), Parkinson's disease dementia (PDD), and dementia with Lewy bodies (DLB). The results showed decreased alpha and beta phase-locking in PDD and DLB patients compared to ADD.

114 - *Poster session 2*

Effect of HRV-biofeedback training for emotional reactivity control in athletes

A. Kovaleva (P.K. Anokhin Research Institute of Normal Physiology, Russian Federation)

The study aimed to reveal HRV-biofeedback training on distractibility during automated movement. Fifteen athletes were exposed to emotional sounds while performing an audio-motor synchronization task, then 5 sessions of HRV-BFB-training were conducted. Training improves performance, increases sustainability and self-regulation skills to stay focused in competitive environment.

115 - *Poster session 1*

Theta and gamma oscillations during sustained attention to response task (SART)

Z. Ülgen (Dokuz Eylül University, Turkey)

The aim of our research group was to investigate the alteration of theta and gamma oscillations during auditory SART task. Sustained attention shown to increase fronto-central theta activity especially in behavioral inhibition and decreased towards the end of the experiment. Parietal gamma activity also decreased with time.

116 - *Poster session 1*

High-functioning adults with autism spectrum disorder differ from neurotypical adults under exploration-exploitation dilemma: MEG study

K. Pultsina (Moscow State University of Psychology and Education, Russian Federation)

Neurotypical adults invest more resources into explorative decisions compared with exploitative ones, while in autistic adults this difference is reduced. Autistic adults, unlike neurotypical persons, do not reveal differential feedback processing after exploratory decisions. Both observations may be related to reduced ability of autistic persons to prioritize decisions and outcomes.

117 - *Poster session 2*

Gut-brain phase-amplitude recovery pattern after a cognitive overloading task differs in irritable bowel syndrome compared with that of healthy controls

J. Rudy (University of Savoie Mont Blanc, France)

Gastric interoception plays a role in stress emergence and regulation. Irritable bowel syndrome (IBS) is a multifactorial somatic pathology involving gut-brain axis dysfunction. We demonstrated that a non-invasive electrophysiological indicator of gastric interoception is modulated differently by recovery after an overloading task for IBS patients compared to healthy controls.

119 - *Poster session 1*

Effect of social importance on prospective memory monitoring cost: An event-related potential study

Y. Sumiya (Hiroshima University, Japan)

We investigated the influence of social importance on the ongoing task's monitoring costs using LPC and P2. Ongoing task's reaction time and P2 amplitudes demonstrated that social importance enhanced prospective memory by increasing monitoring costs, which failed to support previous studies.

120 - *Poster session 2*

User motivation and human-computer interaction in remote working

J. Bessonova (Russian Academy of Sciences, Russian Federation)

The abstract is concerned changes in user attention in response to changes in motivation. Instruction affects the actualization of current needs and task predominance, which leads to directing attention changes. The most sensitive indicators of attentional shift linked to errors are gaze trajectory length, revisits, fixation duration to significant areas.

121 - *Poster session 2*

Targeting mechanisms of emotion regulation during cognitive behavior therapy in depression: Preliminary ERP findings during lateralized presentations of aversive pictures

J. Kayser (Columbia University, United States)

Using an emotional visual half-field paradigm, high-density ERPs were recorded from 25 depressed patients pre- and post-psychotherapy. Top-down regulation of bottom-up emotion processing was associated with treatment success, suggesting abnormal preconscious responsivity to negative arousing stimuli in treatment nonresponders that leads to inhibition of downstream emotional processing.

123 - *Poster session 2*

The arterial baroreflex suppresses the aggressive response to social exclusion

T. Izaki (National Institute of Advanced Industrial Science and Technology, Japan)

This study investigated whether the aggressive response to social exclusion is suppressed by the arterial baroreflex which maintains the arterial blood pressure. We induced the arterial baroreflex by the neck-suction approach. We found that the arterial baroreflex during the cyberball task decreased amounts of hot-sauce related to the aggressive response.

124 - *Poster session 1*

Electrical activity of the frontal lobes in retrieval-induced forgetting

A. Glazkova (Lomonosov Moscow State University, Russian Federation)

In this study, the electrophysiological correlates associated with retrieval-induced forgetting were examined to further the understanding of its underlying mechanisms. According to obtained data, evoked potentials for Rp- and NRp stimuli significantly differed in frontal cortex. The detected differences suggest increased cognitive control inhibiting the retrieval of related non-target information.

127 - *Poster session 2*

Influence of gaze cues on audiovisual memory: Study of event-related potentials

A. Fukushima (Hiroshima University, Japan)

We investigated the effects of gaze on encoding audiovisual association stimuli using event-related potential (ERP): P1, P2 (spatial attention), and N2 (auditory attention) amplitudes. Our results also indicated that gaze cues directed at target stimuli might have a small positive influence on the memory for associated audiovisual stimuli.

130 - *Poster session 1*

Standard slow-paced 0.1 Hz breathing induces stronger cardiac vagal activity than a super-slow 0.05 Hz yoga breathing technique

J. Tatschl (University of Graz, Austria)

Slow-paced 0.1 Hz breathing (SPB) induced stronger cardiac vagal activity than 0.05 Hz super-slow yoga breathing supplemented with breathing pauses (SSB), which triggered a minor physiological stress response. Hence, analogous to physical exercise, regular SSB could foster beneficial psychophysiological adaptations via hormesis, potentially complementing SPB to enhance the latter's effectiveness.

134 - *Poster session 2*

Electrophysiological differences in perception of animate and inanimate objects

A. Glazkova (Lomonosov Moscow State University, Russian Federation)

It was found that visual evoked potentials in response to animate and inanimate objects significantly differ (N250 in the frontal channels and P350-450 in the temporoparietal channels).

135 - *Poster session 1*

Gaze behavior affected by the difficulty of the preference judgments: An eye-tracking study

H. Shoji (Ibaraki University, Japan)

The purpose of this study is to clarify influence of gaze behavior by the difficulty of the preference judgment. Although gaze was directed to the preferred stimulus regardless of the difficulty, the direction of the first saccade and the alternating fixation was affected by the difficulty of the preference judgment.

139 - *Poster session 2*

Emotion regulation flexibility: Neural predictors and consequences of switching between reappraisal and distraction strategies

A. Adamczyk (Radboud University, The Netherlands)

Although emotion regulation flexibility predicts better mental health (a long-term consequence), our study shows that in the short-term, switching between strategies is riskier than maintaining a single strategy and might either strongly decrease (switching from-reappraisal-to-distraction) or increase (switching from-distraction-to-reappraisal) the subsequent emotion responding (Late Positive Potential).

141 - *Poster session 2*

Physical exercise influences attentional orientation towards emotional stimuli

N. Mansouri (Université Paris Nanterre, France)

Pathological and experimental pain lead to an attentional bias towards pain related stimuli. Our study aims to determine whether, like pain, a physical effort perceived as difficult would influence attentional orientation towards emotional stimuli. The eye tracking results show that physical effort leads to the avoidance of pain related stimuli.

142 - *Poster session 2*

The study of skin-optical sense features in different age groups

A. Kovalev (Lomonosov Moscow State University, Russian Federation)

This study devoted to investigation the ability of skin-optical perception in different ages using the psychophysical procedure and uniq equipment for light presentation on skin surface without thermal component. The obtained results indicate the ability of some subjects to feel light exposure.

146 - *Poster session 1*

Pleasantness of cheerful music depends on the emotional burnout formation

S. Tukaiev (Università della Svizzera italiana, Switzerland)

We established that the pleasantness to cheerful music decreased under the burnout formation. The unpleasant reactions to the merry music were accompanied by nonspecific brain activation (alpha3) and higher level of burnout. A positive attitude to cheerful music is characteristic of non-burnout subjects and accompanied decreasing in theta1,2 and alpha 1,2 subbands.

147 - *Poster session 2*

To what extent does stress moderate the effect of technical affinity on user acceptance in the context of digitized-medical consultations?

T. Kurz (Universitätsklinikum Heidelberg, Germany)

We investigated the extent to which subjective and physiological stress moderates the effect of technical affinity on user acceptance of different digitization levels during simulated physician encounters. Preliminary analyses showed that low stress levels, measured using heart rate variability and skin conductance rate, lead to significantly higher user acceptance.

150 - *Poster session 1*

An index of visual information processing

J. Bessonova (Russian Academy of Sciences, Russian Federation)

The study is concerned with an interface vulnerability associated with attention shift during flight multitasking (speed control and situational awareness). The attentional shift comes with increased share of ambient fixation reducing focal fixation. The change in visual information processing modes used as a basis the index of focal/ambient fixations ratio.

151 - *Poster session 2*

Reading skill in children who survived cerebellar tumors: eye movements and cognitive functions

S. Mironets (Dmitry Rogachev National Medical Research Center of Pediatric Hematology, Oncology, and Immunology, Russian Federation)

Damage to the cerebellum arising from, among other reasons, tumor treatment, results in disturbances of reading. Our aim was to investigate eye movements parameters during reading texts and cognitive functions in groups of children.

155 - *Poster session 2*

Trajectories of stress axis biomarkers in police officers undergoing clinical interviewing for PTBS

M. Jarczok (University Medical Center Ulm, Germany)

Police officers are at an increased risk for PTSD and biomarkers may help to identify high risk individuals early on. This study describes relative change in heart rate variability, alpha-amylase and saliva cortisol in response to a PTSD interview. The interview produced a mild stress reaction with fast recovery.

156 - *Poster session 2*

Relationship between sensory processing sensitivity (SPS) and empathic reaction for pain from psychophysiological perspective

I. Chałatkiewicz (SWPS University, Poland)

What characterizes empathic reaction for pain in a highly sensitive person (HSP)? The results revealed that HSP may give emotional significance to both painful and neutral stimuli (no differences in the amplitude P2, N2), thus showing that HSP may be characterized by different dynamics of empathic reaction to pain.

157 - *Poster session 2*

Risk-taking is associated with decreased delta value signal and increased theta prediction error signal in the hot Columbia Card Task

R. Dieterich (Technische Universität Dresden, Germany)

We investigated EEG correlates of model-based expected utility (EU) and prediction errors (PE). High risk-takers shows attenuated EU decision signals, tied to delta activity, and increased PE feedback signals, tied to theta activity. Risk-taking may be linked to insensitivity to decision values and increased sensitivity to outcomes better than expected.

158 - *Poster session 1*

Neural correlates and psychophysiology of cognitive control after-effects in the evaluation of one's own and others' pain

L. Riontino (University of Geneva, Switzerland)

This research shows that cognitive effort aftereffects impact negatively the assessment of medium/high pain in others, reminiscently to what was observed in first-hand experiences. Physiological responses evoked by one's own pain show similar results. Healthcare professionals should be aware that high workload and cognitive fatigue could affect their diagnostic skills.

159 - *Poster session 1*

The effect of interstimulus intervals on the outputs of nTMS motor mapping

A. Sukmanova (Research University Higher School of Economics, Russian Federation)

Inter-stimulus intervals (ISIs) is a parameter that can affect the results of navigated transcranial magnetic stimulation (nTMS) mapping. However, according to the results of our study, ISIs do not have a significant impact on the nTMS mapping outputs, but can be a marker for differences in mapping procedures across sessions.

160 - *Poster session 1*

Neurophysiology of motor re-planning: ERP correlates of initial and final goal perturbations in manual action

L. Yu (Bielefeld University, Germany)

In grasping, action goals are not restricted to grasping the object (the initial goal) but also essential for a subsequent task (the final goal). In this study, ERPs were used to investigate motor re-planning in response to an unexpected change in the initial or final action goals.

172 - *Poster session 1*

The effects of objective parameters of fractals patterns' complexity on anxiety of college students

C. Zhang (Shanghai Jiao Tong University, China)

This study aims to investigate the effect of the fractal patterns' complexity (fractal dimension) on the anxiety treatment of college students through a four-week randomized controlled trial. The results showed that fractal patterns had significant effects in relieving anxiety, with the best result in fractal dimension between 1.3 and 1.5.

176 - *Poster session 1*

The effect of music training on aging: An EEG microstates study

J. Lu (University of Electronic Science and Technology of China)

By studying the intervention of music training on brain aging through microstate, we found that the duration of microstate D in old musicians was significantly higher than that of old non-musicians, which suggested that music intervention affects attentional perception in the aging process to some extent.

177 - *Poster session 2*

Brain-to-brain coupling and prediction of interpersonal cooperation and aggression

G. Liang (Fuzhou University, China)

We explored the brain-to-brain coupling in the interactive Chicken Game. Results show that the phase locking value (PLV) of bilateral cooperation (CC) is significantly higher than that of one-side cooperation and the other aggression (CA) and bilateral aggression (AA). The PLV of CC significantly predict the next cooperation choice.

178 - *Poster session 1*

Disrupted functional coupling of vision-emotion network in psychosis risk syndromes evidenced from representational similarity analysis

L. Zhang (The Fourth People's Hospital of Chengdu, China)

Psychosis risk syndromes subjects showed decreased functional couplings between two basic visual conditions, as well as vision-emotion matching conditions. Our findings might indicate that PRS subjects have abnormal visual processing in the primary visual cortex as well as in more advanced information processing.

179 - *Poster session 2*

State switching pattern of motor imagery revealed by hidden Markov models

Y. Liu (Xihua University, China)

Motor imagery (MI), as a prevalent paradigm in BCI research, has attracted much attention in recent years. HMM offer a unique perspective of instantaneous network dynamic switching captured at large time scales. At this scale, various characteristics of dynamic network switching are visible.

180 - *Poster session 1*

Compensatory mechanism within default mode network in schizophrenia subjects evidence from dynamic time warping functional connectivity analysis

S. Yu (The Fourth People's Hospital of Chengdu, China)

Dynamic Time Warping (DTW) is more sensitive to assess the relationship among signals of brain regions. Compensatory mechanism within Default mode network in schizophrenia subjects could be assessed by DTW analysis.

181 - *Poster session 2*

Hypothalamic-pituitary-adrenal (HPA) axis dysfunction in women with premenstrual syndrome: a meta-analysis

R. Zhou (Nanjing University, China)

To systematically evaluate the hypothalamic-pituitary-adrenal (HPA) axis dysfunction of women with premenstrual syndrome (PMS) at baseline and in the face of environmental challenges, a total of 32 studies were included in the meta-analysis (total sample size N = 1280) from 1990 to 2021.

187 - *Poster session 1*

Eye tracking pilot study of approximate number sense

S. Mironets (Dmitry Rogachev National Medical Research Center of Pediatric Hematology, Oncology, and Immunology, Russian Federation)

A person, starting from a very early age, is faced with the need to process and analyze quantitative information, such as comparing objects by their size, comparing the number of objects, counting them. The aim of the study is to assess eye movement parameters during processing of quantitative visual information.

197 - *Poster session 2*

Ventral-temporal/parietal neural circuitry for holistic face- and object- perception: evidence from a case of prosopagnosia

M. Bobes Leon (Cuban Neuroscience Center, La Habana, Cuba)

We describe a case of prosopagnosia, with a deficit in holistic processing. Neuroimaging showed a lesion in the right hemisphere that spares structure and function of the occipital and fusiform face-selective areas. The lesion damage the scene-selective ventromedial temporal areas and the white matter connecting these areas with parietal lobe.

198 - *Poster session 2*

How mood-related physiological states bias economic decisions

R. Heerema (University College London, United Kingdom)

We demonstrate incidental effects of induced happiness and sadness on economic choices, in the sense that positive mood shifts preferences towards costly but more rewarding options. These effects are observed whatever the cost type (risk, effort or delay) and whether mood is assessed with self-reports or reconstructed from physiological signals.

199 - *Poster session 1*

The determinants of covid-induced brain disorders after covid-19 infection

S. Yasir (University of Electronic Science and Technology of China)

This study shows that the severity of COVID-19 infection is related to post-COVID neuropsychiatric symptoms (post-COVID NPS). Patients with pre-health comorbidities, like chronic obstructive pulmonary diseases, diabetes, immunosuppression, renal diseases, or cardiovascular diseases may have a high risk of getting more severe COVID-19 and eventually more long-term neuropsychiatric symptoms.

203 - *Poster session 2*

Age difference in correlations and interactions between respiratory sinus arrhythmia and frontoparietal coherence predicting cognitive regulation

J. Christensen (University of Massachusetts, United States)

Respiratory sinus arrhythmia and frontoparietal alpha power coherence are associated with cognitive regulation. They are influenced by age, and although often studied in isolation, they may interact. We estimated the interactive effects of these variables on cognitive regulation. We found that age moderated the interactive effects on cognitive regulation.

205 - *Poster session 2*

Analysis of brain responses in an auditory stimulation paradigm: event-related potentials and fnirs hemodynamics

C. Gómez (University of Sevilla, Spain)

Brain response in auditory paradigms is a widely studied topic, but for fNIRS there are many doubts about the scope and limitations. The present study aims to contribute to the understanding of intensity modulation in the auditory cortex analyzed by fNIRS, while simultaneously recording the EEG to obtain auditory ERPs.

206 - *Poster session 1*

Multimodal neurophysiological response in an auditory pattern-based stimulation paradigm

C. Gómez (University of Sevilla, Spain)

The study attempts to demonstrate the existence of a differential pattern of activity in the presence of deviants of predictive sound sequences in passive and active conditions through a multimodal and systemic approach, that includes the analysis of brain and autonomic responses.

207 - *Poster session 2*

The effect of music training and aging on the periodic and non-periodic components of EEG

J. Lu (University of Electronic Science and Technology of China)

A study has reported a new algorithm that can decompose the EEG into periodic components and aperiodic components. Few studies explore how music training intervenes with aging using this method. Thus, we recruited musicians and non-musicians of different ages to study the effect of music training on aging.

SOCIAL EVENTS

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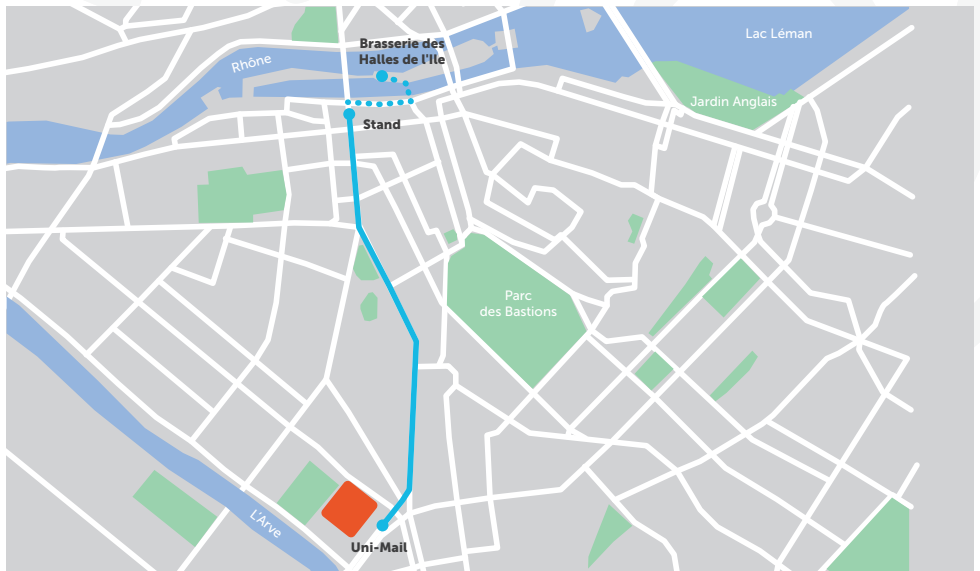
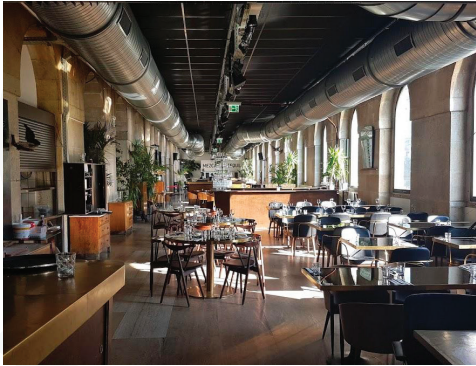
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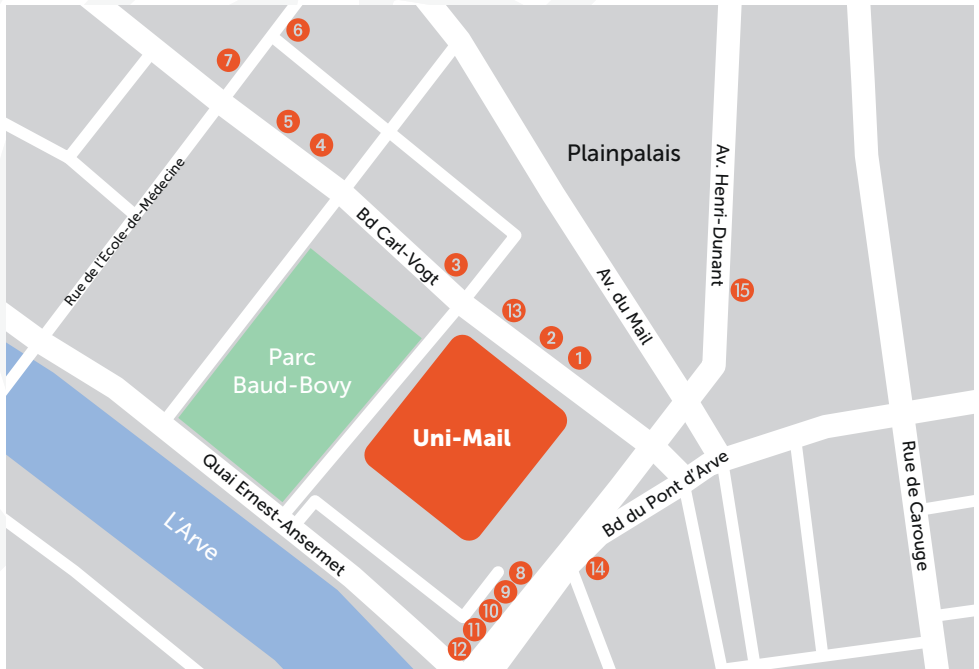
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All **coffee breaks**, the **welcome reception** and the **social reception** are included in the fees.

Lunch breaks are on your own. You can get lunch in the cafeteria located in the UniMail building (about 10 to 18 Swiss Francs). There are also a number of nice restaurants just outside of the UniMail building that offer reduced-price lunch options (ask for the “plat du jour”, about 20 to 25 Swiss Francs). You find these restaurants on Boulevard Carl-Vogt, Rue de l'École-de-Médecine and on Boulevard du Pont-d'Arve (see map). This is a non-exhaustive list of nice restaurants close by:

- On Boulevard Carl-Vogt: Twins **1**, Mangia Bene **2**, Lucha Libre **3**, Trulli **4**, Le Green Café **5**, Chiche ou pas chiche **13**
- On Rue de l'École-de-Médecine: Café du Lys **6**, Volt Bar **7**
- On Boulevard du Pont-d'Arve: Inglewood **8**, Chez ma Cousine **9**, A Table **10**, Los Bandidos **11**, Alles Gut! Gemüsekebab **12**, Lady Godiva **14**
- On Avenue Henri-Dunant: Café du Marché **15**

Especially **for dinner**, you might have a look at “The Fork” (<https://www.thefork.ch/>) that offers reduced prices on meals in many places in Geneva, when making the reservation via the app.

AROUND GENEVA



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Two guided tours of the old town have been organized for conference participants:

- Monday June 26, departure 11h from the congress center (Uni Mail)
- Wednesday June 28, departure 10h from the congress center (Uni Mail)

If you are interested in registering for the tour, please go to the conference registration desk at Uni Mail. Thank you.

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