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Talk 2
Neural correlates of emotion regulation strategies in Borderline Personality Disorder and Anorexia Nervosa: fMRI Study☆

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Dysfunctional emotion regulation (ER) is a core feature of both borderline personality disorder (BPD) and anorexia nervosa (AN). However, the neuronal mechanisms underlying common ER strategies—cognitive reappraisal and emotion suppression—using disorder-specific stimuli (relevant to BPD and AN) remain largely unexplored. Women with BPD (N = 44), AN restrictive type (N = 38), and healthy controls (N = 40) completed clinical self-report measures and performed an fMRI task involving cognitive reappraisal and emotion suppression with disorder-relevant stimuli. In response to disorder-specific stimuli, BPD patients exhibited increased activation in the anterior orbitofrontal and dorsal anterior cingulate cortices relative to controls. In AN, cognitive reappraisal elicited heightened activity in the right angular gyrus and cingulate/precuneus, along with reduced activation in the left central operculum and inferior frontal gyrus. These differential patterns highlight distinct neuronal mechanisms in which prefrontal and parietal circuits are selectively engaged during ER. All groups reported a more negative state post-task, with clinical groups showing greater negativity reflecting the task's demands and emotional burdens in these disorders. Our findings reveal distinct neuronal mechanisms of ER in BPD and AN. The differential engagement of neural circuits during disorder-specific ER tasks enhances our understanding of the pathophysiology underlying these disorders and may inform targeted interventions.

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Talk 3
Dopaminergic Modulation of Neural Circuits during Fear Extinction☆

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Fear extinction re-associates previously threatening stimuli as safe by reorganizing neuronal circuits involved in threat processing and emotional regulation. Dopamine is suggested to be a key modulator of fear extinction, but research of dopamine receptors in humans is scarce. We hypothesized that dopamine D2 receptors would be related to neural activity and connectivity during fear extinction. Fifteen healthy adults (mean±SD age 25±5.2 years, 9 females) underwent ^{11}C-raclopride positron emission tomography to measure dopamine D2 receptor availability. They then completed fear acquisition and immediate extinction during functional magnetic resonance imaging (fMRI) and skin conductance measures (SCR). Two conditioned stimuli (CS+, reinforced with an electric shock on 16 trials; CS-, never reinforced) were presented 20 times each during fear acquisition. Fear extinction used 20 unreinforced presentations each of CS+ and CS-. A linear mixed-effects model of SCR during fear extinction revealed larger SCR to CS+ than CS- stimulus (b= 0.16, p= 0.014), but no interaction with extinction phase (early: trial 1-5; late: trial 16-20) was detected (b=-0.118, p=0.205). Neural activity and functional connectivity analyses focusing on the regions of interest (ROI) amygdala, vmPFC, dACC and insula showed increased activity (CS+>CS-) in the right anterior insula(cluster corrected FWEc=191). We also tested associations between SCR and fMRI measures and dopamine D2 availability in the amygdala, dorsal and ventral striatum. Dopamine D2 receptor availability in the dorsal striatum modulated CS+>CS- connectivity between the right anterior insula and vmPFC, no associations between D2 and SCR or neural activity were detected. These results are in line with previous findings of insula and vmPFC involvement in fear extinction and partly support the importance of dopamine in fear extinction. The small number of participants should be noted and the results taken as preliminary until replicated in larger samples.

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Talk 4
Central Executive Network Mediates Social Media Addiction's Impact on Emotion-Regulatory Strategy Selection: an EEG study☆

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Electroencephalography microstate analysis has emerged as a powerful tool for investigating the temporal dynamics of large-scale brain networks with millisecond precision. While microstates analysis has been widely applied to cognitive and clinical neuroscience, its role in affective processes, particularly in emotion regulation (ER), remains limited. ER deficits have been identified as a key contributing factor to social media addiction (SMA), and ER selection flexibility—the ability to adaptively choose ER strategy based on context—is critical for effective emotion regulation. Therefore, this study aimed to investigate the effect of social media addiction (SMA) on ER selection flexibility and explore its underlying neural mechanisms using EEG microstate analysis. Sixty-four university students (13 males, 51 males; mean age = 20.66 ± 2.39) completed the Bergon social media addiction scale (BSMAS), underwent a resting-state EEG recording (5-minute eye-open and 5-minute eye-closed) and performed an ER selection task. In this task, participants chose between distraction and reappraisal to regulate emotions elicited by affective scenes varying in intensity (high/low) and valence (positive/negative). We found that higher SMA scores were associated with reduced ER selection flexibility in negative contexts, reflected in a diminished shift from reappraisal to distraction as intensity increased from low-negative to high-negative contexts. Additionally, while the higher SMA scores were associated with increased occurrence frequency of microstate D and F, only the frequency of microstate D negatively was related to ER flexibility.

Mediation analysis further revealed that the frequency of microstate D, mainly involving the activity of frontal-parietal network and linked to executive function, mediated the relationship between SMA and ER selection flexibility. These findings suggest that impaired ER flexibility is a key feature of SMA, potentially driven by abnormalities in the frontal-parietal network. Understanding these mechanisms may inform interventions targeting emotion regulation in individuals with SMA.

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Talk 5

Influence of a Vipassana (Mindfulness) Meditation Retreat on Wellbeing, Emotion Regulation and Heart Rate Variability☆

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Mindfulness meditation is associated with wellbeing and psychological health. One proposed mechanism of mindfulness is emotion regulation, associated with reduced psychological symptoms. Heart rate variability (HRV), particularly high-frequency (HF-HRV), can index vagal activation and autonomic balance. HRV is associated with psychological health, and is a proposed index of self-regulatory capacity. This study examined effects of a Vipassana (mindfulness) meditation retreat on wellbeing, mindfulness, psychological symptoms, HRV, and emotion regulation. The retreat was expected to increase wellbeing, reduce psychological symptoms, increase HRV at rest (tonic) and during a meditation task, and improve emotion regulation. HF-HRV was expected to correlate with wellbeing and psychological health, and to increase during emotion regulation. 39 participants were tested before and after a 10-day Vipassana retreat, compared to 20 control participants, using Linear Mixed Effects modelling. Participants completed questionnaires, a meditation task, and an emotion regulation task using affective pictures. Images were rated for valence and arousal, and phasic (task-related) HRV was recorded. The retreat improved mindfulness, stress, and suppression compared to control. Other psychological measures improved in both groups. The retreat did not increase HRV at rest or during meditation. Reappraisal reduced emotional reactivity, suggesting it is an adaptive regulation strategy, but did not alter phasic HRV. The retreat reduced overall emotional reactivity, suggesting that improvements don't rely on emotion reappraisal but apply more broadly. Contrary to hypotheses, phasic HRV was unchanged during reappraisal, and tonic HF-HRV was uncorrelated with measures of wellbeing and psychological health. Vipassana showed promise in improving mindfulness and some measures of wellbeing and psychological health. Neither retreat nor reappraisal influenced HRV, and HRV was unrelated to psychological health. This poses challenges for the use of HRV as a proxy measure for emotion regulation and more research is needed to clarify relationships between HRV and emotion regulation ability.

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Single talk session 7; VISUAL PROCESSING

Talk 1

Compatibility of a competition model for explaining eye fixation durations during free viewing☆

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Intersaccadic times or eye fixation durations (EFD) are relatively stable at around 250ms, equivalent to around 4 saccades by ms. However, mean and standard deviation are not sufficient to describe the frequency histogram distribution of EDF. The exgaussian has been proposed for fitting the EFD histograms. Present report tries to adjust a competition model (C model) between the saccadic and the fixation network to the EDF histograms. Both models were adjusted to EFD from an open database with data of 179473 eye fixations. The C model showed to be able, along with exgaussian model, to be compatible for explaining the EFD distributions. The two parameters of the C model can be ascribed to (i) a refractory period for new saccades modelled by a sigmoid equation (A parameter), while (ii) the p parameter would be related to the continuous competition between the saccadic network related to the saliency map, and would be modelled through a geometric probability density function. The model suggests that competition between neural networks would be an organization property of brain neural networks to facilitate decision process for action and perception.

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Talk 2

Event segmentation in naturalistic settings: Influencing factors and neurophysiological underpinnings☆

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Understanding human perception and cognitive control is essential for advancing the diagnosis and treatment of psychiatric disorders. This project investigates underlying neural mechanisms and further manipulation factors, by integrating event segmentation theory (EST) and electroencephalography (EEG) measurements. EST describes how the brain organizes continuous information into meaningful segments by forming a working event model as a representation of the current situation based on previous experiences stored in event schemata and updating these models based on prediction errors. Using an event segmentation task, a movie stimulus, and various analysis tools at both sensor and source levels of signal processing, firstly, we examined these processes in healthy adults, revealing distinct EEG frequency band patterns corresponding to each of the described subprocesses. These findings elucidate the mechanistic chain underlying event segmentation. We extended these investigations to healthy adolescents, comparing their event segmentation processes with those of adults to explore developmental differences. Further research examined the modulation of cognitive control states through pharmacological manipulation of the catecholaminergic system, using methylphenidate, providing insights into neurochemical influences on event segmentation. Additionally, another study evaluates the effects of brain stimulation interventions on cognitive processes, using transcranial direct-current stimulation (tDCS), exploring the causal role of superior/middle frontal gyri for event segmentation in addition to correlational findings. This line of research seeks to identify cognitive biomarkers that shed light on how the brain processes and interprets the world, deepening our understanding of