Lingnan University Conference on Cognitive Science 2025

Neurocognitive Pathways: Understanding Perception and Social Processing in the Brain

Friday session, May 9, 2025

LYH201/1, Main Campus, Lingnan University

10am: Professor Charles Leek, University of Southampton

COVID-19 is associated with global cognitive impairment, elevated brain injury markers and grey matter volume reduction in anterior cingulate cortex one year post hospitalisation.

The spectrum, pathophysiology and recovery trajectory of persistent post-COVID-19 cognitive deficits are unknown, limiting our ability to develop prevention and treatment strategies. We report the 1-year cognitive, serum biomarker and neuroimaging findings from a prospective, UK-based national study of cognition in 351 COVID-19 patients who required hospitalization, compared with 2,927 normative matched controls. Cognitive deficits were global, associated with elevated brain injury markers and reduced anterior cingulate cortex volume 1 year after COVID-19. Severity of the initial infective insult, post-acute psychiatric symptoms, and a history of encephalopathy were associated with the greatest deficits. There was strong concordance between subjective and objective cognitive deficits. Longitudinal follow-up in 106 patients demonstrated a trend toward recovery. Together, these findings support the hypothesis that brain injury in moderate to severe COVID-19 may be immune-mediated, and should guide the development of therapeutic strategies.

10.40am: Professor Luyan Ji, Guangzhou University

Automatic ensemble coding of multiple facial expressions: Evidence from visual mismatch responses

The human brain efficiently extracts both the mean emotion and emotional variability from multiple facial expressions. However, whether these processes occur automatically—without attention—remains debated. To investigate automaticity in mean emotion processing, we employed a passive oddball paradigm. Participants focused on a central fixation task while we recorded event-related potentials (ERPs). Four peripheral faces displayed either mean negative (one happy, three angry) or mean positive (one angry, three happy) emotions, presented as deviants (20%) or standards (80%). Cluster-based permutation analyses revealed that mean negative emotions elicited early visual mismatch negativity (vMMN) from 92 ms, while mean positive emotions evoked later mismatch positivity (vMMP, 168–266 ms), suggesting valence-dependent automatic processing. To further examine automaticity in emotional variability processing, we conducted three experiments manipulating variability (low vs. high) while controlling mean emotion. In Experiment 1 (neutral mean), faces with high variability elicited vMMN at 110–140 ms and 320–420 ms, whereas those with low variability did not. Multivariate pattern analysis (MVPA) confirmed early decoding (<100 ms) for both conditions. Experiment 2 tested angry/happy mean emotions: angry faces with low variability elicited vMMN, while angry faces with high variability evoked vMMP (320–420 ms). Happy sets showed no significant effects. MVPA revealed delayed decoding onset for low-variability conditions. Experiment 3 controlled range and distribution, replicating early decoding and showing vMMP for faces with high variability. Together, these findings demonstrate that both mean

emotion and emotional variability can be processed automatically. Notably, mean negative and mean positive emotions may engage different neural mechanisms. Additionally, higher emotional variability appears to have an advantage in automatic processing, though this effect is modulated by the valence of emotions.

11.20am: Professor Haiyang Jin, Zhejiang Sci-Tech University

Two faces of holistic face processing

Faces are visually similar, and our extensive experience with them makes them a unique visual stimulus for humans. One of the ways face processing is special is its holistic nature—facial parts are obligatorily integrated into a unified whole (Gestalt). Most prevailing hypotheses treat holistic face processing as a one-dimensional construct. However, recent findings challenge this view. For example, studies report weak or nonsignificant correlations between holistic processing effects measured by different paradigms derived from distinct hypotheses, suggesting these paradigms may not assess the same underlying mechanism. To address this issue, we propose that holistic face processing consists of (at least) two distinct aspects: facilitation and interference. Our findings reveal that different paradigms measuring holistic processing capture either facilitation, interference, or both. Crucially, facilitation effects correlate across paradigms, as do interference effects—indicating that holistic processing is reflected by multiple dissociable components. This “two faces of holistic processing” framework has the potential to reconcile conflicting findings in the literature and advance our understanding of face perception.

No registration is necessary. For more details, please contact Professor Will Hayward (willhayward@ln.edu.hk) or Chris Stolle (chris.stolle@cognitive-science.group)