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INTRODUCTION

International Affect, Personality, and Embodied Brain (APE) Network

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This special issue comprises a selection of representative studies from the Affect, Personality and Embodied Brain conferences. The included studies span behavioral and brain studies of nonclinical and clinical populations.

Keywords: Affect, Personality, Brain, electroencephalography, functional magnetic resonance imaging

The international Affect, Personality, and Embodied Brain (APE) network emerged in 2020, during the COVID-19 pandemic, as a platform to share knowledge, maintain training, and cultivate collaboration globally across research centres and groups. The network hosts an annual APE conference, organized by academics and students from Nottingham Trent University (United Kingdom), University of Salford (United Kingdom), and Universidade Católica Portuguesa (Portugal), with delegates from 20 counties. This special issue comprises a selection of representative studies from the pandemic conferences.

The APE network aligns with the perception of psychological and physical well-being as being intimately linked, and the nexus between these constructs as integrative health, impacted by biological predisposition and lifestyle factors of risk and resilience. The network has a strong interest in biological processes and shared mechanisms that impact psychological function and human health. Research investigates cognitive and affective traits that influence our behaviors, with particular regard to their biological underpinnings and application to understanding healthy and unhealthy function across the life span. As such, this work encompasses psychometric and experimental investigations of maladaptive behavior (e.g., aggression, risk-taking), psychopathology (e.g., schizophrenia, depression), neurological conditions (e.g., functional neurological disorder, mild cognitive impairment, dementia), and noncommunicable diseases (e.g., cancer, diabetes, obesity). Alongside psychological measures (e.g., personality, emotion, psychometrics, cognition), state-of-the-art biomarker discovery methods are used to assess neurocognitive and physiological functions. Ultimately, APE members seek to discover, develop, and evaluate ways to optimize living (offline and online) throughout the life span.

In infants (7–12 months of age), for example, Lourenço et al. (2021) investigate the development of turn-taking during the processing of objects and faces. This longitudinal study elucidates the foundations and developmental trajectories of turn-taking and provides novel

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contextual perspectives on the phenomenon, with methodological and theoretical implications. Twenty-five mother–infant dyadic, semi-structured interactions are examined across conditions involving (1) free play with toys, (2) free play without toys, and (3) challenging object play. Comparisons are made between object-oriented (1, 3) and face-to-face conditions in terms of gap durations and turn transitions. By 12 months, infants are producing very similar behaviors to adults. Such turn-taking behavior contributes to the development of healthy communication and empathy.

The COVID-19 pandemic has been a major influence on psychological well-being worldwide, but with some intercountry differences, as the world moved more toward online communication. The impact of this transition on development in young people is of particular interest. Penalba-Sánchez et al. (2022) report on a cross-national survey, examining the role of social media and body dissatisfaction in psychological well-being, prior to—and following the onset of the COVID-19 pandemic. They show higher body dissatisfaction and stress in Portuguese compared to British young women, while the opposite pattern was seen for depression. There was a general decline in well-being and an increase in body dissatisfaction and social media use with the onset of the pandemic. The change in depression and stress levels with the onset of the pandemic is partially explained by changes in body dissatisfaction and social media use.

During the pandemic, touch became taboo, impacting psychological well-being. Nurturing touch is critical to healthy communication, contributing to psychological and physical development throughout the life span, and stimulates the release of hormones (oxytocin, dopamine) associated with well-being. Nurturing touch and the presence of oxytocin facilitate healing (psychological and physical) and protect against the adverse impact of harm and age-associated decline, in part through regulation of the immune system, and enhancement of discriminative efficiency of the threat-response system (amygdala, hypothalamus). Sumich et al. (2022) report on a novel intervention grounded in nurturing touch called havening. They show an acceleration in the reduction of subjective reports of distress and alteration in brain function (i.e., decline in electroencephalographic [EEG] γ power) following an intervention using nurturing touch, compared to a similar intervention without nurturing touch.

Along with traditional analytical techniques, several studies have applied artificial intelligence methods to EEG data in order to understand, classify, and predict psychological states and pathological conditions. For example, EEG is used to classify states of emotional distress in Weerasinghe et al. (2022). In that study, a machine learning (ML) method known as spiking neural networks (SNN) is applied to EEG data, recorded during 40 brief (~1 min) videos. The authors classified videos as inducing stress or relaxed states based on subjective reports of arousal and valence. They then apply SNN to EEG data to classify brain states of stress or relaxation. This novel, explainable technique was able to classify psychological states based on brain activity with 83% accuracy, which is higher than previous studies using the same data set (which ranged from 65% to 81% accuracy).

In relation to clinical conditions, Abdi-Sargezeh and Sanei (2021) critically review the development of several ML methods to detect and classify epileptic activity in EEG data, including several advances in deep neural networks made by the Sanei Lab, such as the application of convolutional neural networks which offer several performance advantages over other methods.

In older adult studies, ML methods are applied to EEG data to differentiate pathological aging (Parkinson's disease, dementia of Alzheimer's type) from healthy older adults. In Silva et al. (2022), for example, EEG nonlinear multiband analysis is performed to extract features for several classifiers (decision trees, support vector machines, K-nearest neighbors, logistic regression), within a leave-one-out cross-validation procedure. They highlight the importance of θ and γ activity in differentiating healthy from pathological aging.

In addition to understanding pathological conditions, neuroimaging methods have been applied to investigate the neurocognitive mechanisms underpinning personality and individual differences in the general population. Reinforcement sensitivity theory, for example, is a neurobiological account of motivation, emotion, and learning, initially developed from animal studies that has been subsequently translated into a human personality framework. Standen et al. (2022) systematically review functional MRI studies which partially corroborate the

proposed mechanisms but also indicate value in refinement of the theory.

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