

## **Modulated Error-Related Negativity (ERN/ERP) in Depressed Patients Exposed to Mindfulness-Based Cognitive Therapy**

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Mindfulness-Based Interventions (MBIs) are steadily infiltrating mainstream healthcare as nonpharmacological alternatives with evidence-based efficacy for depression and anxiety, commonly co-morbid among chronic conditions. Depression is a significant leading cause of disability worldwide according to the World Health Organization (WHO). Mindfulness-Based Cognitive Therapy (MBCT) shows high clinical efficacy for mood disorders, whilst neurobiological mechanism and specificity has not been fully disentangled. Our previous work has examined the Error Processing System in Major Depressive Disorder (Schoenberg, 2014), finding amplitude differences in depressed patients compared to healthy controls, regardless of stage of illness (characteristic of a phenotype). Aberrated error processing is significant since it reflects deficits in cognitive and emotional flexibility to disengage and adapt to future responses, detrimentally affecting goal-directed cognition and behaviors. This study presents first phase data from an investigation into the effects of MBCT upon error processing in depressed patients, specifically examining the early component Error-Related Negativity (ERN) Event-Related Potential (ERP). Patients undertook an emotional Go-NoGo task concomitant to electroencephalographic (EEG) recording, pre and post MBCT exposure. Findings elucidated two main patterns: (1) ERN amplitude was enhanced with False Alarms (FAs) to neutral NoGo trials, compared to emotionally valenced conditions (positive, negative), and (2) examining by valence dichotomy, attenuated amplitude for FAs to negative stimuli was observed, compared to marginal modulation for positive stimuli, pre-to-post MBCT. This preliminary data supports that MBCT may target the Error Processing System with emotional specificity for attenuation from negative saliency, suggesting an adaptive mechanistic pathway involving attention and executive allocation during threat-related processes.