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Topic: AS13 Emotion, Memory and Cognition

VISUAL-ORIENTATION DISCRIMINATION THRESHOLDS CAN BE PREDICTED BY PEAK GAMMA FREQUENCY AND VISUAL EVOKED POTENTIAL N1 PEAK AMPLITUDE

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Excitation-inhibition (E-I) balance has been indirectly inferred from psychophysical measures (i.e., performance in orientation discrimination task [ODT]) and neurophysiological measures (i.e., gamma frequency oscillations and amplitudes of visual evoked potential (VEP)) due to their associations with gamma-aminobutyric acid (GABA), the major inhibitory transmitter. Although previous studies have found an association between enhanced ODT performance and higher peak gamma frequency, the relationship between ODT performance and VEP activity has yet to be explored. Therefore, the current study investigates to what extent performance in ODT could be predicted by gamma frequency activities (peak gamma frequency and gamma frequency power) and amplitudes of VEP components (N1 and P2). Forty-nine healthy adult participants completed an ODT comprising vertical and oblique conditions and an EEG visual task that has been shown to elicit strong peak gamma frequency and VEP activity. Multiple linear regression analyses showed that only performance in the oblique condition of ODT but not in the vertical condition could be highly predicted by neurophysiological measures. Specifically, enhanced performance in the oblique ODT is associated with higher peak gamma frequency and/or lower VEP-N1 peak amplitude. These

findings support the suggested association between increased cortical inhibition (indicated by enhanced performance in the ODT), higher peak gamma frequency, and lower VEP-N1 amplitude.

Declaration of Interest Statement: None

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