Analysis

EEG data were analysed using MNE Python (Gramfort et al. (2013), version 1.7). Data were resampled to 250 Hz and notch filtered at 50 Hz to eleminate line power noise. A bandpass filter between 1 and 40 Hz was applied using FIR filter (firwin2 method). Bad channels were identified using the Python implementation of the Preprocessing Pipeline (PREP, Bigdely-Shamlo et al. (2015)), were temporarily excluded from analysis and later extrapolated after performing Independent Component Analysis (ICA).

Dataset was epoched into 5s intervals, with 1.5s overlap between epochs (0.75s on each side). The Autoreject library (Jas et al. 2017) was used to detect and remove epochs containg huge artifacts (epochs identified as bad on more than 40% bad channels were discarded). ICA was performed on the data using a variable number of the components determined by capturing 99% of cumulative variance. The picard method was employed with the settings `fit_params=dict(ortho=False, extended=True)`, which aligns with `FastICA` algorithm utilizing the infomax approach (?need to double check)).

The ICA components were visually inspected and those identified as artifacts were removed. The data were then reconstructed using the remaining components. For the further analysis, we computed the power spectral density (PSD) using the Welch method. PSD calculations were performed for each epoch and then averaged across epochs. The specparam algorithm (formerly known as fooof, (Donoghue et al. 2020)) was applied with the following parameters: freq_range = [1, 40], peak_width_limits = [1, 6], min_peak_height = 0.15, peak_threshold = 2.0, and max_n_peaks = 6. Similarly to McKeown et al. (2023), we excluded participants with specparam model fits < 0.9 R2 on more than 50% of the channels.

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