ATTENTIONAL MODULATION OF HEARTBEAT-EVOKED POTENTIALS AFTER CONTROLLING FOR COGNITIVE DEMANDS

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Background: Heartbeat-evoked potentials (HEP) have been shown to be modulated by attentional focus (cardiac vs. exteroceptive attention), suggesting that HEP are a neural correlate of interoceptive prediction errors. However, recent evidence suggests that this attentional effect is not consistently replicated. Different cognitive demands between interoceptive vs. exteroceptive attention blocks may be a putative confounding factor.

Aims: To examine whether a modified heartbeat attention manipulation that accounts for cognitive demands modulates HEP amplitude. To explore whether the attentional modulation of HEP amplitude is associated with self-reported interoception measures (task-related and questionnaires).

Methods: A community-sample of 26 participants (13F; 21.73y) completed EEG (geodesic 64-channel sensor net) and ECG recordings during a modified Heartbeat Attention Task. In exteroceptive blocks, subjects were required to count subtle bursts of volume increase embedded within a continuous white noise. The bursts' volume was individually tailored for each participant (near absolute threshold) and were presented in a rhythmic pattern replicating a typical heart rate. In interoceptive blocks, participants were asked to count their heartbeats, whilst the white noise was still presented, ensuring that the neural effects were driven by the attention shift rather than sensory changes.

Preliminary Results: Significant HEP amplitude modulation at Cz (p = .009, d = 0.557) and FC1 (p = .044, d = 0.416). Significant differences between conditions in heartbeat vs. exteroceptive focus (p < .001, d = 1.271) and counting confidence (p < .001, d = 0.865). Positive association between self-reported heartbeat focus and HEP amplitude at Cz, r = .356, p =.074, and FC1, r = .452, p =.020. This dataset is currently under additional processing before conducting a more comprehensive data-driven analytic approach (cluster-based permutation test).

Keywords: Interoception, Cardioception, Heartbeat-evoked potentials, Attention, EEG

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