5. Supplementary Materials

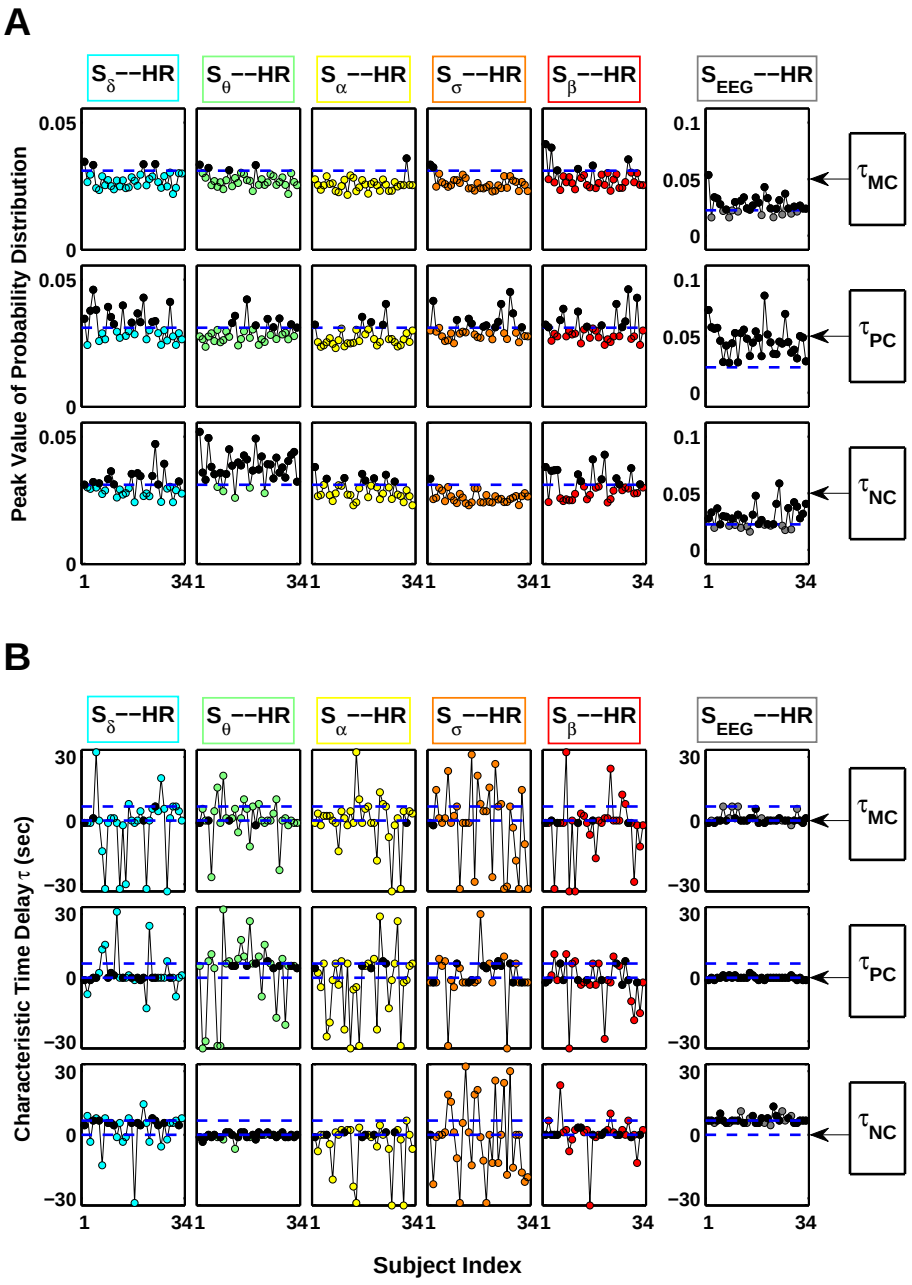

Figure 5. (Supplementary Figure) **Inter-subject variability of characteristic time delays.** (A) Peak values of the probability distribution profiles (shown in Fig. 3) for all 34 subjects in the database are shown in each panel for different pairs of brain-heart interaction (columns) and different characteristic time delays τ_{MC}, τ_{PC}, and τ_{NC} (rows). Horizontal axis is the subject index (no particular order) and the vertical axis is the peak value of the probability distribution profiles of the time delays. Blue dashed line represent a threshold of probability $p = 0.028$ (approximately twice as the expected value for a uniform distribution). Subject with significant peak values (above the threshold) are marked with full circles. We identify three key pairs of brain-heart interaction: (i) S_δ – HR; (ii) S_θ – HR and (iii) S_{EEG}-HR. All these pairs exhibit pronounced peaks (above the threshold) in large fraction of the subjects. (B) Characteristic time delays corresponding to the peak values of the probability distribution for all subjects shown in (A). Horizontal axis is the subject index (same order as in (A)) and the vertical axis is the time delay corresponding to the peak in the probability distribution. Dashed lines indicate time delays of 0 and 6s. Notably, S_{EEG}-HR interactions are characterized by $\tau_{PC} \approx 0$ and $\tau_{NC} \approx 6$ consistently for all subjects, indicating the presence of a characteristic time scale in total EEG power and heart rate interaction. These characteristic time delays are also pronounced for S_δ – HR, S_θ – HR and S_β – HR interactions, for both τ_{PC} and τ_{NC}. Note that subjects with time delay τ that significantly deviate from the characteristic time scale of $\tau = 0s$ and $\tau = 6s$ shown in (B) are also characterized by insignificant peak values (below threshold; open colored circles) of the probability distribution shown in (A) for each pair of brain-heart interaction.