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DIMENSIONALITY OF MULTICHANNEL EEG (OMEGA COMPLEXITY) DURING MEDITATION IN FIVE TRADITIONS

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Introduction: The measure of complex dimensionality assesses the number of independent processes that generate an observed time series.
Objectives: To investigate whether meditation exercises are associated with fewer or more independently active brain processes, and whether different meditation traditions show different results.
Aims: Does brain electric complex dimensionality differ between the state of meditation and of task free resting in different meditation traditions?
Methods: Multichannel EEG recordings (19 to 25 channels) from experienced meditators of five meditation traditions (13 Tibetan Buddhists, 15 Qigong, 14 Shaja Yoga, 14 Ananda Marga Yoga, and 15 Zen) were analyzed (bandpass 1.5-30 Hz) using ´Omega Complexity´ that obtains a single value for a set of simultaneously recorded EEG time series from a given person (J. Wackermann, Acta Neurobiol Exp (Wars) 1996;56:197-208). Omega Complexity during meditation was compared to the mean of Omega Complexity during pre- and post-meditation resting.
Results: During meditation relative to resting (paired t tests), Omega Complexity was higher in all five traditions, significant for Tibetan Buddhists ($p=0.01$), Ananda Marga Yoga ($p=0.007$) and Zen ($p=0.0003$).
Conclusion: The subjectively experienced agreeable feelings during meditation apparently occur, across meditation traditions, during a brain functional state that is characterized by an increase of independent brain processes compared to task free resting.

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