EEG spectral modulations involved in self-regulation of independent component alpha power

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**Background**
Learned control over various aspects of the EEG power spectrum has potential for communication and prosthetic control and is being explored for several therapeutic applications.

**Objectives**
1) Demonstrate feasibility of gaining control over spectral power of an independent component (IC) process as opposed to power arriving at a single scalp electrode.
2) Determine whether independent modulators (IMs) of contribute to successful control of EEG spectral power of a single IC source.

**Task/Methods**
Procedure:
1. Sixteen-channel EEG were collected to learn a subject source unmixing matrix.
2. A right mu component was selected as the feedback component for 4 days of low-dose modular training.
3. N-back EEG was filtered on-line using the channelancouver method of independent component analysis (ICA).
4. Learned control over various aspects of the EEG power spectrum has potential for communication and prosthetic control and is being explored for several therapeutic applications.

**Conclusions**
1) Gaining conscious control over activity of an independent EEG component is feasible and could possibly be of more use than single scalp channel control.
2) Several independent EEG modulator processes were active during successful control of alpha band activity in a right mu component.

>> However, the spectral modulations involved in this control changed over sessions.