Slow cortical potential training in stroke

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Sample

We provide EEG data recorded during eight SCP neurofeedback sessions from two chronic stroke patients. Neurofeedback sessions were conducted with an approximate interval of one week between sessions.

Experimental paradigm

EEG recording

EEG was recorded with a sampling rate of 256 Hz from electrode Cz (referenced against the right mastoid) using a Nexus-10 MKII DC amplifier (Mindmedia, Herten, The Netherlands). Vertical eye movements were recorded using two bipolar electrodes mounted above and below one eye.

Procedure

Each neurofeedback session included trials in which cortical positivity had to be increased and trials in which cortical negativity had to be increased. The subject was placed comfortably in front of computer monitor. Trials lasted for 8 s (baseline: 0-2 s, active phase: 2-8 s). Online feedback consisted of a circle whose size and color indicated whether the subject regulated successfully with regard to baseline activity. Trials were judged successful, and success indicated to the participant, if brain activation was regulated as required by the task (towards positivity or negativity, respectively).

Stimuli

In Sessions 1-3 the number of positivity and negativity trials was the same (250 trials each). In sessions 4-8, negativity trials (375) were more frequent than positivity trials (125). At the beginning of the feedback phase subjects read instructions to either enlarge or minimize the feedback circle. During regulation up (positivity) or down (negativity) pointing arrows served as a reminder of the required direction of regulation.

Data file description

Data is stored in Matlab's .mat-file format. Each file consists of a cell-array "data" which includes 8 structs corresponding to the eight recording sessions. Within each struct, the following variables are defined.

- **X**: the recorded EEG data matrix (samples x channels) referenced against linked mastoids and low pass filtered (10 Hz).
- **y**: the stimulus classes (numeric vector)
- **trial**: when the stimulus was presented (numeric vector)
- **classes**: strings (positivity vs. negativity) identifying the stimuli (cell array)
- **fs**: sampling frequency (scalar)
- **subject**: subject identifier (char vector)
- **session**: the session number (1-8)