EEG Signals – Active Visual Oddball Stimuli

Experiment: Standard Vs Oddball Visual Stimuli.

Data Acquisition

The continuous EEG signals were recorded using a Biosemi ActiveTwo recording system with active electrodes (Biosemi B.V., Amsterdam, the Netherlands). An elastic EEG cap was used with 30 scalp electrodes mounted in it and placed according to the International 10/20 System (FP1, F3, F7, FC3, C3, C5, P3, P7, P9, PO7, PO3, O1, Oz, Pz, CPz, FP2, Fz, F4, F8, FC4, FCz, Cz, C4, C6, P4, P8, P10, PO8, PO4, O2). The common mode sense (CMS) electrode was located at PO1, and the driven right leg (DRL) electrode was located at PO2. The horizontal electrooculogram (HEOG) was recorded from electrodes placed lateral to the external canthus of each eye. The vertical electrooculogram (VEOG) was recorded from an electrode placed below the right eye. All signals were low-pass filtered using a fifth order sinc filter with a half-power cutoff at 204.8 Hz and then digitized at 1024 Hz with 24 bits of resolution. Nevertheless, data are here provided after being down sampled at 256 Hz for computational reasons. The signals were recorded in single-ended mode (i.e., measuring the voltage between the active and ground electrodes without the use of a reference), and offline referencing (e.g. to the mastoid sites P9-P10) is recommended.

Experimental Procedure

40 subjects (neurotypical young adults) were recruited. The subjects sat on a comfortable armchair in front of a screen. They were asked to minimize the movements of any part of the body during the data recording. The experiment consisted of one session of visual stimuli. The letters A, B, C, D, and E were presented in random order (p = .2 for each letter). One letter was designated the target for a given block of trials, and the other 4 letters were non-targets in order to elicit the P300 component. Thus, the probability of the target category was .2, but the same physical stimulus served as a target in some blocks and a nontarget in others (Luck et al. 2009). Participants were asked to respond whether the letter presented on each trial was the target or a non-target for that block and the results (both response times and outcomes) were stored with the recorded data. Each session comprised ~ 5-10 min of brain activity recording during which visual stimuli (duration 200 ms) were delivered with a random inter stimulus interval (range: 1450 - 1500 ms). An example of a subset of the trials during the active visual oddball task is represented in the Figure 1. A black cross on the screen appeared in between two consecutive visual stimuli.

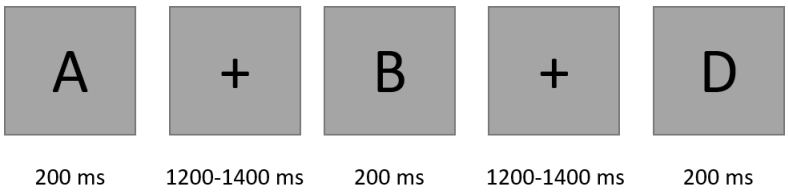

Figure 1 - Example of a subset of the trials during the active visual oddball task.

Data Organization

The following files are provided for each recruited subject:

- **V_EEG**: 1x1 struct
  - **hdr** header with the general info of the recording
  - **label** channel labels
  - t**ime** time axis
  - **trial** data
- **V_event**: 1x400 struct, task onset markers
  - **type** 'trigger' or 'response time'
  - **value** marker event

onset stimulus onset (s)
difference time difference between consecutive markers (ms)
class event label description
response marker outcome response
response_class response label description

- **MNT**: electrodes montage. (Additional 3D coordinate electrodes referred to the cap are provided with the file 'standard-10-5-cap-385.elp'),

Demographic Information

SubID	Age	Gender	Handedness
1	20	M	right
2	24	F	right
3	18	F	right
4	21	F	right
5	23	M	right
6	22	M	right
7	20	F	right
8	25	F	right
9	30	F	right
10	20	F	right
11	19	F	right
12	25	M	left
13	22	M	right
14	30	M	right
15	21	M	right
16	20	F	right
17	19	F	right
18	23	F	right
19	19	M	left
20	20	F	right
21	23	M	right
22	20	F	right
23	22	F	right
24	21	M	right
25	19	F	right
26	20	M	right
27	21	M	right
28	21	F	right
29	20	F	right
30	19	F	right
31	20	F	right
32	21	M	right
33	28	F	right

34	18	F	right
35	24	M	right
36	19	F	right
37	22	F	right
38	19	F	right
39	21	F	right
40	21	M	right

- Gender: Male (M) / Female(F)
- Handedness: Left / Right

Citation

1. Impaired response selection in schizophrenia: Evidence from the P3 wave and the lateralized readiness potential. Steven J. Luck, Emily S. Kappenman, Rebecca L. Fuller, Benjamin Robinson, Ann Summerfelt, and James M. Gold.