STUDY design and plotting overview

STEP 1
Build a STUDY

STEP 2
Build design(s)

STEP 3
Precompute the data

STEP 4
Plot the data

Exercise...
Memory options should change when using STUDY vs single dataset.
Create simple ERP STUDY

This interface creates a simple STUDY and computes its condition grand average ERPs. For each subject, trials for each condition must first be stored in a separate dataset. Create other STUDY using the standard editor.

Number of conditions: 2
Number of subjects: 15
Create simple ERP STUDY

**STUDY set name:** Letter memorization task

<table>
<thead>
<tr>
<th>Condition 1 name</th>
<th>Condition 2 name</th>
</tr>
</thead>
<tbody>
<tr>
<td>letter-ignore</td>
<td>letter-memorize</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condition 1 datasets</th>
<th>Condition 2 datasets</th>
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When using more than 1 condition, datasets on each line must correspond to the same subject.
Create simple ERP STUDY
Suggestion for exercise

1. From the GUI, select “File > Create STUDY > Simple ERP STUDY”

2. Enter 2 conditions “letter-ignore” and “letter-memorize”

3. In the column for “letter-ignore” select datasets “ignore.set” for 3 subjects S01, S02, S03 (in the STUDY folder)

4. In the column for “letter-memorize” select datasets “memorize.set” for 3 subjects S01, S02, S03 (in the STUDY folder)

5. Press OK.
Create design

1x3 design
Design independent of # of files per subject
Other design examples
Other design examples
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Exercise...
Precompute data measures
Choose which channel

Choose which subject
Computing Spectrum
Choose which channel

Choose which subject
Computing ERSP

'cycles', [3 0.8], 'nfreqs', 50, 'ntimesout', 100
ERSP/ITC plotting options

- Time range in ms [Low High]: -500 1000
- Freq. range in Hz [Low High]: 3 30

Additional options:
- Compute common ERSP baseline (assumes additive baseline)
ERP-image across subjects

Figure 4. Channel ERP

ERP - CZ

- ignore
- memorize
- probe

Potential (μV)

Time (ms)

-1000 -500 0 500 1000 1500

General statistical parameters

- Compute 1st independent variable statistics
- Use single trials (when available)

Use EEGLAB statistics

- Use parametric statistics
- Use FDR correction

Use Fieldtrip statistics

- Use analytic/parametric statistics
- Do not correct for multiple comparisons

CC channel neighbor parameters

CC clustering parameters

- 'method', 'triangulation'
- 'method', 'maximum'

Statistical threshold (p-value)

Randomization (n)

0.05
auto

Cancel  Ok
std_stat() function in EEGLAB
Exercises

1. Load “stern.study” file in STUDY folder
2. Edit STUDY design and delete current variable(s)
3. Create a new indep. Variable design to compare Ignore vs. Memorize letter
4. Recompute spectrum and ERP.
5. Plot spectrum and ERP for electrode Fz
6. Plot scalp topography at 10 Hz (spectrum) and 200-300 ms (ERP) for both conditions
7. Spectrum for electrode Fz within 1 to 50 Hz and compute parametric statistics (with and without FDR correction)
8. Plot scalp topography at 10Hz for both conditions using permutation statistics cluster correction (Fieldtrip – statistics)