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...
Formalizing experimental protocols
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

Condition 1 name
letter-ignore

Condition 2 name
letter-memorize

Condition 1 datasets
/data/STUDY/S01/Ignore.set
/data/STUDY/S02/Ignore.set
/data/STUDY/S03/Ignore.set

Condition 2 datasets
/data/STUDY/S01/Memorize.set
/data/STUDY/S02/Memorize.set
/data/STUDY/S03/Memorize.set

When using more than 1 condition, datasets on each line must correspond to the same subject.
Create simple ERP STUDY
Build a STUDY
Build a STUDY, cont'd
Edit dataset info
Experimental design

1x2 unpaired
- Patients
  - Group A
  - Group B
- Controls

1x2 paired
- Stim A
- Stim B

2x2 unpaired
- Patients
  - Old
  - Group A
  - Group B
- Controls
  - Old
  - Group A
  - Group B

2x2 paired
- Patients
  - Stim A
  - Stim B
  - Drug A
  - Drug B
- Controls
  - Stim A
  - Stim B
  - Drug A
  - Drug B

2x2 paired & unpaired
- Patients
  - Stim A
  - Stim B
  - Drug A
  - Drug B
- Controls
  - Stim A
  - Stim B
  - Drug A
  - Drug B
Build a STUDY, alternative method

<table>
<thead>
<tr>
<th>dataset filename</th>
<th>browse</th>
<th>subject</th>
<th>session</th>
<th>condition</th>
<th>group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
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<tr>
<td>10</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Important note: Removed datasets will not be saved before being deleted from EEG. All memory.

Update dataset info - datasets stored on disk will be overwritten (unset = Keep study info separate).
Delete cluster information (to allow loading new datasets, set new components for clustering, etc.)

Choose dataset to add to STUDY -- pop_study()
Edit dataset info

![Edit dataset info interface](image)

**Edit STUDY set information - remember to save changes**

- **STUDY set name:** Stemberg (two blank lines)
- **STUDY set task name:** Stemberg (two blank lines)
- **STUDY set notes:**

<table>
<thead>
<tr>
<th>dataset filename</th>
<th>browse</th>
<th>subject</th>
<th>session</th>
<th>condition</th>
<th>group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volumes/donnees/data/STUDYset/file1</td>
<td>-</td>
<td>S01</td>
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<tr>
<td>Volumes/donnees/data/STUDYset/file2</td>
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<td>S02</td>
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<tr>
<td>Volumes/donnees/data/STUDYset/file3</td>
<td>-</td>
<td>S03</td>
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<tr>
<td>Volumes/donnees/data/STUDYset/file4</td>
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<td>S04</td>
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<tr>
<td>Volumes/donnees/data/STUDYset/file5</td>
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<td>S05</td>
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<tr>
<td>Volumes/donnees/data/STUDYset/file7</td>
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<td>S07</td>
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<tr>
<td>Volumes/donnees/data/STUDYset/file8</td>
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<td>S08</td>
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<tr>
<td>Volumes/donnees/data/STUDYset/file9</td>
<td>-</td>
<td>S09</td>
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</tr>
<tr>
<td>Volumes/donnees/data/STUDYset/file10</td>
<td>-</td>
<td>S10</td>
<td></td>
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</tr>
</tbody>
</table>

**Important note:** Removed datasets will not be saved before being deleted from EEGLAB memory

- **Update dataset info - datasets stored on disk will be overwritten (unset = Keep study info separate).**
- **Delete cluster information (to allow loading new datasets, set new components for clustering, etc.).**

[Help] [Cancel] [Ok]
Create design

1x3 design
Edit STUDY design -- pop_studydesign()
### Select STUDY design
- Audio versus light all subjects
- All stimulus type - non dual subjects only
- Blank versus other stimulus type - non dual subjects only
- Audio preceded by different stimulus types
- Audio versus light across sessions - non dual subjects only
- Audio versus light across presentation - non dual subjects only

### Subjects
<table>
<thead>
<tr>
<th>c1</th>
<th>c2</th>
<th>c3</th>
<th>c4</th>
<th>c5</th>
<th>c6</th>
<th>c7</th>
<th>c8</th>
</tr>
</thead>
<tbody>
<tr>
<td>nc1</td>
<td>nc2</td>
<td>nc3</td>
<td>nc4</td>
<td>nc5</td>
<td>nc6</td>
<td>nc7</td>
<td>nc8</td>
</tr>
</tbody>
</table>

### Independent variable 1
- None
- Group
- stimulationType
- presentation
- session
- prevent

### Ind. var. 1 values
- audio
- blank
- both
- light
- audio - light

### Independent variable 2
- None
- Group
- stimulusType
- presentation
- session
- prevent

### Ind. var. 2 values

### Options
- Combine selected values
- Unpaired statistics
- Use only specific datasets/trials
- Delete all datatiles associated with this STUDY design
- Save the STUDY

### Buttons
- Add design
- Rename design
- Delete design
- Cancel
- Ok
Exercises

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 “probe.set” for 3 subjects S01, S02, S03 (in the STUDY folder)

5. Press OK.
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Plot the data

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
Pre-compute measures
View and edit clusters
Plot cluster data

Choose which cluster

Plot mean scalp maps for easy reference
Plot cluster data

Choose which cluster

Choose which components
Plot cluster data
Exercises

1. Load stern.study in STUDY folder

2. Create a new STUDY design to compare two types of conditions
   - Ignore letter *grouped* with Memorize letter
   - Probe letters

3. Recompute spectrum and plot spectrum for electrode Fz

4. Plot scalp topography at 10 Hz for both conditions