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...

Copy and uncompressed STUDY_v2.zip from your USB key
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**

<table>
<thead>
<tr>
<th>/data/STUDY/S01/Ignore.set</th>
<th>...</th>
<th>/data/STUDY/S02/Ignore.set</th>
<th>...</th>
<th>/data/STUDY/S03/Ignore.set</th>
<th>...</th>
</tr>
</thead>
<tbody>
<tr>
<td>/data/STUDY/S01/Memorize.set</td>
<td>...</td>
<td>/data/STUDY/S02/Memorize.set</td>
<td>...</td>
<td>/data/STUDY/S03/Memorize.set</td>
<td>...</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>...</td>
<td></td>
<td>...</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
<td>...</td>
<td></td>
<td>...</td>
<td></td>
</tr>
</tbody>
</table>

**Condition 2 datasets**

When using more than 1 condition, datasets on each line must correspond to the same subject.

[Help] [Cancel] [Ok]
Create simple ERP STUDY
Build a STUDY
Build a STUDY, cont'd
Edit dataset info

Create a new STUDY set -- pop_study()

Edit STUDY set information - remember to save changes

STUDY set name: ___________________________
STUDY set task name: ___________________________
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>
<th>Select by r.v.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volumes/donneesi/data/STUD_1</td>
<td>...</td>
<td>S01</td>
<td></td>
<td>memorize</td>
<td></td>
<td>All comp.</td>
</tr>
<tr>
<td>Volumes/donneesi/data/STUD_2</td>
<td>...</td>
<td>S01</td>
<td></td>
<td>ignore</td>
<td></td>
<td>All comp.</td>
</tr>
<tr>
<td>Volumes/donneesi/data/STUD_3</td>
<td>...</td>
<td>S01</td>
<td></td>
<td>probe</td>
<td></td>
<td>All comp.</td>
</tr>
<tr>
<td>Volumes/donneesi/data/STUD_4</td>
<td>...</td>
<td>S02</td>
<td></td>
<td>memorize</td>
<td></td>
<td>All comp.</td>
</tr>
<tr>
<td>Volumes/donneesi/data/STUD_5</td>
<td>...</td>
<td>S02</td>
<td></td>
<td>ignore</td>
<td></td>
<td>All comp.</td>
</tr>
<tr>
<td>Volumes/donneesi/data/STUD_6</td>
<td>...</td>
<td>S02</td>
<td></td>
<td>probe</td>
<td></td>
<td>All comp.</td>
</tr>
<tr>
<td>Volumes/donneesi/data/STUD_7</td>
<td>...</td>
<td>S03</td>
<td></td>
<td>memorize</td>
<td></td>
<td>All comp.</td>
</tr>
<tr>
<td>Volumes/donneesi/data/STUD_8</td>
<td>...</td>
<td>S03</td>
<td></td>
<td>ignore</td>
<td></td>
<td>All comp.</td>
</tr>
<tr>
<td>Volumes/donneesi/data/STUD_9</td>
<td>...</td>
<td>S03</td>
<td></td>
<td>probe</td>
<td></td>
<td>All comp.</td>
</tr>
<tr>
<td>Volumes/donneesi/data/STUD_10</td>
<td>...</td>
<td>S04</td>
<td></td>
<td>memorize</td>
<td></td>
<td>All comp.</td>
</tr>
</tbody>
</table>

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

< Page 1 >

- Dataset info (condition, group, ...) differs from study info. [set] = Overwrite dataset info.
- Delete cluster information (to allow loading new datasets, set new components for clustering, etc.)

Help Cancel OK
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
Young
Group C
Group D

2x2 paired

Stim A
Stim B

Drug A
Drug B

2x2 paired & unpaired

Patients
Drug A
Drug B

Controls
Create design

1x3 design
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>
<td>⬅️</td>
<td>⬅️</td>
<td>⬅️</td>
<td>⬅️</td>
<td>⬅️</td>
</tr>
<tr>
<td>2</td>
<td>⬅️</td>
<td>⬅️</td>
<td>⬅️</td>
<td>⬅️</td>
<td>⬅️</td>
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<tr>
<td>3</td>
<td>⬅️</td>
<td>⬅️</td>
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<td>⬅️</td>
<td>⬅️</td>
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<tr>
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<td>⬅️</td>
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<td>⬅️</td>
<td>⬅️</td>
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<tr>
<td>5</td>
<td>⬅️</td>
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<td>⬅️</td>
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<tr>
<td>6</td>
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<td>⬅️</td>
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<td>⬅️</td>
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<tr>
<td>7</td>
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<td>⬅️</td>
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</tr>
<tr>
<td>8</td>
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<td>⬅️</td>
<td>⬅️</td>
<td>⬅️</td>
<td>⬅️</td>
</tr>
<tr>
<td>9</td>
<td>⬅️</td>
<td>⬅️</td>
<td>⬅️</td>
<td>⬅️</td>
<td>⬅️</td>
</tr>
<tr>
<td>10</td>
<td>⬅️</td>
<td>⬅️</td>
<td>⬅️</td>
<td>⬅️</td>
<td>⬅️</td>
</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.)
Edit dataset info
Create design

1x3 design
**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**
- c1
- c2
- c3
- c4
- c5
- c6
- c7
- c8
- nd1
- nd2
- nd3
- nd4
- nd5
- nd6
- nd7
- nd8

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

**Ind. var. 2 values**
- control
- nondual

**Use only specific datasets/trials**

**Delete all datafiles associated with this STUDY design**

**Save the STUDY**
### 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>nd1</td>
<td>nd2</td>
<td>nd3</td>
<td>nd4</td>
<td>nd5</td>
<td>nd6</td>
<td>nd7</td>
<td>nd8</td>
</tr>
</tbody>
</table>

### Independent variable 1

- None
- group
- stimulusType
- presentation
- session
- preevent

#### Ind. var. 1 values

- audio
- blank
- both
- light
- audio - light

### Independent variable 2

- None
- group
- stimulusType
- presentation
- session
- preevent

#### Ind. var. 2 values

- (empty)

- [Choose options]

- Combine selected values

- Unpaired statistics

- Use only specific datasets/trials

- Delete all datafiles associated with this STUDY design

- Save the STUDY

- Cancel

- Ok
STUDY design and plotting overview

STEP 1
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Exercise...
Exercises

Suggestion for exercise

1. Copy the STUDY_v2.zip file from the USB key and uncompress it.
2. From the GUI, select “File > Create STUDY > Simple ERP STUDY”
3. Enter 2 conditions “letter-ignore” and “letter-memorize”
4. In the column for “letter-ignore” select datasets “ignore.set” for 3 subjects S01, S02, S03.
5. In the column for “letter-memorize” select datasets “probe.set” for 3 subjects S01, S02, S03.
6. Press OK.
Precompute data measures
Choose which channel

Choose which subject
Computing Spectrum

Use ‘timerange’ option to select time range, see “help std_spec”
Choose which channel

Choose which subject
Computing ERSP

'cycles', [3 0.8], 'nfreqs', 50, 'ntimesout', 100
2. Pre-compute measures
3. Cluster components
View and edit clusters
Plot cluster data

Choose which cluster to plot:
- All cluster centroids
- ParentCluster 1 (181 ICs)
- Outlier 2 (1 ICs)
- Cls 3 (5 ICs)

Select component(s) to plot:
- Outlier 2' comp. 1 (S12 IC12)
- Cls 3' comp. 1 (S05 IC11)
- Cls 3' comp. 2 (S05 IC11)
- Cls 3' comp. 3 (S06 IC15)

Plot scalp maps for easy reference.

Plot mean scalp maps for reference.
Plot cluster data

Choose which cluster

Choose which components
Plot cluster data

Study 'Attention': 181 of 181 components clustered

Select cluster to plot

Cis 5 (3 ICs)
Cis 7 (10 ICs)
Cis 8 (5 ICs)
Cis 9 (12 ICs)

- Plot scalp maps
- Plot dipoles
- Plot ERPs
- Plot spectra
- Plot ERSPs
- Plot ITCs
- Plot cluster properties

Select component(s) to plot

All components
S01 IC6
S05 IC9
S06 IC12

- Plot scalp map(s)
- Plot dipole(s)
- Param
- Plot ERP(s)
- Plot spectra
- Plot ERSPs
- Plot ITC(s)
- Plot component properties

Create new cluster
Rename selected cluster
Merge clusters

Save STUDY set to disk

/home/julie/WorkshopSD2007/STUDY

Cancel  Help  Ok
Exercises

Suggestion for exercise

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