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

Memory options should change when using STUDY vs single dataset.
Build a STUDY
Build a STUDY, cont'd

[Diagram of a software interface for creating a new STUDY set showing fields for dataset filename, browse, subject, session, condition, group, and options for selecting and clearing items.]
Edit dataset info

Edit STUDY set information - remember to save changes

<table>
<thead>
<tr>
<th>STUDY set name:</th>
<th>Sternberg</th>
</tr>
</thead>
<tbody>
<tr>
<td>STUDY set task name:</td>
<td>Sternberg</td>
</tr>
<tr>
<td>STUDY set notes:</td>
<td></td>
</tr>
</tbody>
</table>

<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>
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<tbody>
<tr>
<td>Volumes/donnees/data/STUD</td>
<td>...</td>
<td>S01</td>
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<td>memorize</td>
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<td></td>
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<tr>
<td>Volumes/donnees/data/STUD</td>
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<td>Volumes/donnees/data/STUD</td>
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<td>Volumes/donnees/data/STUD</td>
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<td>Volumes/donnees/data/STUD</td>
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<td></td>
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<tr>
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<td>memorize</td>
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<td></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.)
Experimental design

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

1x2 paired
- Stim A
- Stim B

2x2 unpaired
- Patients
  - Old
    - Group A
    - Group B
  - Young
    - Group C
    - Group D
- Controls

2x2 paired
- Stim A
- Stim B

2x2 paired & unpaired
- Patients
  - Drug A
  - Drug B
- Controls
  - Drug A
  - Drug B
Create design

1x3 design

Select STUDY design

Subjects

Independent variable 1

Ind. var. 1 values

Independent variable 2

Ind. var. 2 values

Combine selected values

Use only specific datasets/trials

Save the STUDY
Number of event fields is unlimited.

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Value</th>
<th>Condition</th>
<th>Duration</th>
<th>Init Index</th>
<th>Init Time</th>
<th>Load</th>
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<tbody>
<tr>
<td>Trial 1</td>
<td>1</td>
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<td>3.112</td>
<td>2</td>
<td>2</td>
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</tbody>
</table>
Build a STUDY, alternative method
Edit dataset info

Create a new STUDY set -- pop_study()

Edit STUDY set information - remember to save changes

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</thead>
<tbody>
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<td>Clear</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.)

Help Cancel Ok
Create design

1x3 design

Select STU DY design

Ignore vs. Memorize vs. Probe

Subjects

Independent variable 1

Independent variable 2

Ind. var. 1 values

Ind. var. 2 values

Combine selected values

Use only specific datasets/trials

Delete all datafiles associated with this STU DY design

Save the STU DY

Add design

Rename design

Delete 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 preceeded by different stimulus types
Audio versus light accross sessions - non dual subjects only
Audio versus light accross presentation - non dual subjects only

Subjects
- c1
- c2
- c3
- c4
- c5
- c6
- c7
- c8
- nd1
- nd2
- nd3
- nd4
- nd5
- nd6
- nd7
- nd8

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

Combine selected values

Use only specific datasets/trials

Delete all datafiles associated with this STUDY design

Save the STUDY

Cancel  Ok
STUDY design and plotting overview

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Exercise...
Precompute data measures
Choose which channel

Choose which subject
Set ERP plotting parameters -- pop_erpparams()

Time range in ms [low high]:
Plot scalp map at latency [ms]:
- Plot first variable on the same panel
- Plot second variable on the same panel

Plot limits in uV [low high]:
Display filter in Hz [high]:

Statistical method to use:
- Parametric
- Statistical threshold (p<) 0.05
- Compute first variable statistics
- Compute second variable statistics
- Use single trials (when available)
- Use False Discovery Rate to correct for multiple comparisons

STUDY name 'Sternberg' - 'S'
Select channel to plot:
- All CZ
- All C5
- All C2
- All C1

Figure 4: Channel ERP
ERP - CZ

Potential (µV)
- ignore
- memorize
- probe

Time (ms)
-1000 -500 0 500 1000 1500
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

Plot mean scalp maps for easy 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)
- Plot ERP(s)
- Plot spectra
- Plot ERSP(s)
- Plot ITC(s)
- Plot component properties

- Create new cluster
- Rename selected cluster
- Merge clusters

- Reassign selected component(s)
- Remove selected outlier comps.
- Auto-reject outlier components

- Save STUDY set to disk
  /home/julie/WorkshopSD2007/STUDY

- Cancel
- Help
- Ok
Exercises

Suggestion for exercises:

Load stern.study in STUDY folder

From the GUI, plot grand average ERP for all channels. Experiment with statistics.

Build a STUDY design to compare Ignore letter grouped with Memorize letter with Probe letters. Recompute spectrum and plot spectrum for electrode Fz using statistics. Do the same for the frontal midline component cluster (cluster 19).