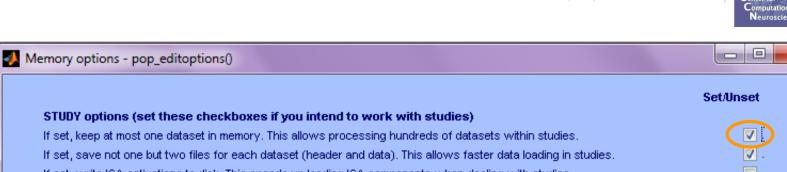


**STEP 1** Build a STUDY STEP 2 Build design(s) **STEP 3** Precompute the data **STEP 4** Plot the data Exercise...



#### **Memory options**



If set, write ICA activations to disk. This speeds up loading ICA components when dealing with studies. Memory options EEGLAB ✓. If set, use single precision under Matlab 7.x. This saves RAM but can lead to rare numerical imprecisions. If set, use memory mapped array under Matlab 7.x. This may slow down some computation. ICA options Import data ☑. If set, precompute ICA activations. This requires more RAM but allows faster plotting of component activations. Import epoch info **v**. If set, scale ICA component activities to RMS (Root Mean Square) in microvolt (recommended). Import event info Folder options Export ☑. If set, when browsing to open a new dataset assume the folder/directory of previous dataset. Load existing dataset Save current dataset(s) **Option file:** C:\Users\julie\Documents\MATLAB\functions\adminfunc\eeg\_options.m Save current dataset as Help Cancel Ok Create study <del>i uata</del> ect continuous Load existing study ract epochs" Memory options should change Save current study > Remove ICA" Save current study as when using STUDY vs single dataset

Clear study

Memory and other options

Save history

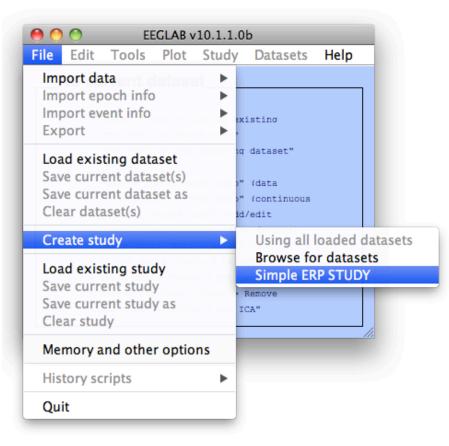
Quit

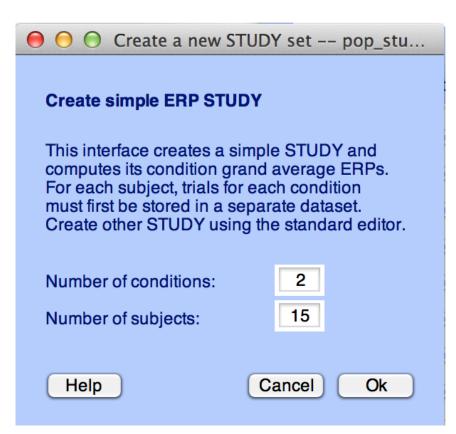
.

File

#### **Create simple ERP STUDY**

many how when any the second when a second when a second of the second o





	Create simple ERP STUD	Y			
hand when have have	STUDY set name:		Le	tter memorization task	mmunum
	Condition 1 name			Condition 2 name	
	letter-ignore			letter-memorize	
	Condition 1 datasets			Condition 2 datasets	
	/data/STUDY/S01/lgn	ore.set		/data/STUDY/S01/Memorize.set	
	/data/STUDY/S02/lgn	ore.set		/data/STUDY/S02/Memorize.set	
	/data/STUDY/S03/lgn	ore.set		/data/STUDY/S03/Memorize.set	



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

•••

....

...

...

....

Help

Cancel

Ok

•••

...

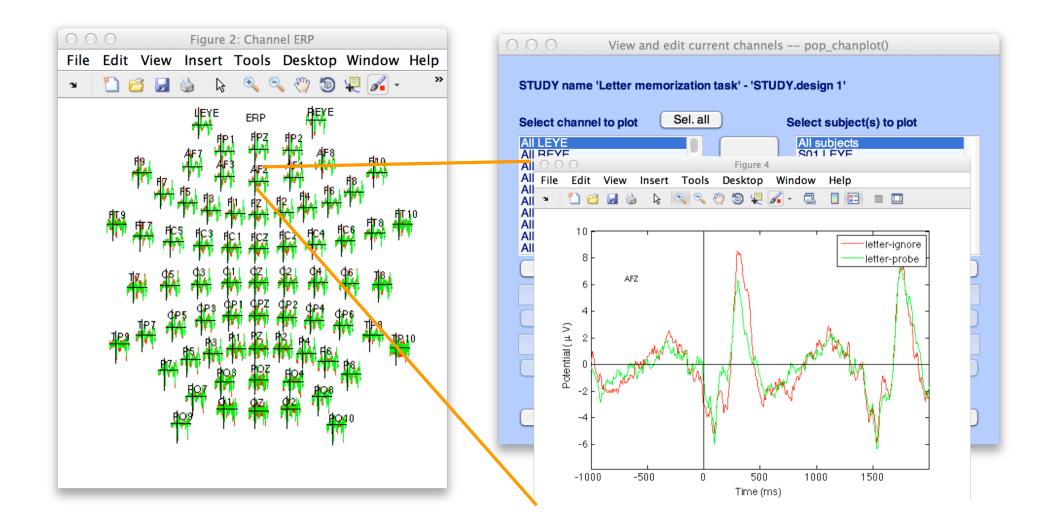
...

...

Neuroscienc

#### **Create simple ERP STUDY**





#### Exercises

# man have a second and the second of the second and the second and



#### Suggestion for exercise

- 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.

EEGLAB v15.x	(dev	<i>י</i> )	
File Edit Tools Plot Stu	ıdy	Datasets	Help
Import data Import epoch info Import event info Export	* * * *	berg	
Load existing dataset <b>Save current dataset(s)</b> Save current dataset as Clear dataset(s)	ner ner	subject subject	
Create study	•		l loaded dat
Load existing study Save current study Save current study as Clear study / Clear all			Err datasets
Memory and other options			
History scripts	•		
Manage EEGLAB extensions	·		





STUDY set name: Sternberg									
STUDY set task name: Sternberg									
STUDY set notes:									
dataset filename		browse	subiect	sessio	on condition	aroup	Select by r.v.		
/data/oral/EEGLAB/ASPE	T_2017/L		S01	1	memorize	1	Comp.: 3 5	Clear	
/data/oral/EEGLAB/ASPE	T_2017/L		S01	1	ignore	1	Comp.: 3 5	Clear	
/data/oral/EEGLAB/ASPE	T_2017/L		S01	1	probe	1	Comp.: 3 5	Clear	
/data/oral/EEGLAB/ASPE	T_2017/L		S02	1	memorize	1	Comp.: 5 6	Clea	
/data/oral/EEGLAB/ASPE	T_2017/L		S02	1	ignore	1	Comp.: 5 6	Clear	
/data/oral/EEGLAB/ASPE	T_2017/L		S02	1	probe	1	Comp.: 5 6	Clear	
/data/oral/EEGLAB/ASPE	T_2017/L		S03	1	memorize	1	Comp.: 6 8	Clear	
/data/oral/EEGLAB/ASPE	T_2017/L		S03	1	ignore	1	Comp.: 6 8	Clear	
/data/oral/EEGLAB/ASPE	T_2017/L		S03	1	probe	1	Comp.: 6 8	Clear	
/data/oral/EEGLAB/ASPE	T_2017/L		S04	1	memorize	1	Comp.: 1 2	Clear	
portant note: Removed datasets	s will not be	e saved be	efore beina dele	eted from	EEGLAB memory				

Dataset info (condition. aroup. ...) differs from study info. [set] = Overwrite dataset info for each dataset on disk.

Delete cluster information (to allow loading new datasets, set new components for clustering, etc.)

Help	Cancel	Ok

STUDY set:	tudy Datasets Help
STUDY set:	
	Edit study info Select/Edit study design(s)
Study filename:s/data Study task name	Precompute channel measures Plot channel measures
Nb of subjects Nb of conditions Nb of sessions Nb of groups Epoch consistency	Precompute component measures Measure Product clustering PCA clustering (original) Edit/plot clusters
Channel locations Clusters Status	61 yes 1 Pre-clustered 8.2

## **Create design**

....

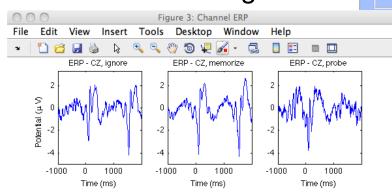
Edit STUDY design -- pop\_studydesign() Include these subjects (default: all) **Group-level contrast** New Rename Delete memorize vs ignore Edit the independent variables for this contrast New Edit Delete List conditions

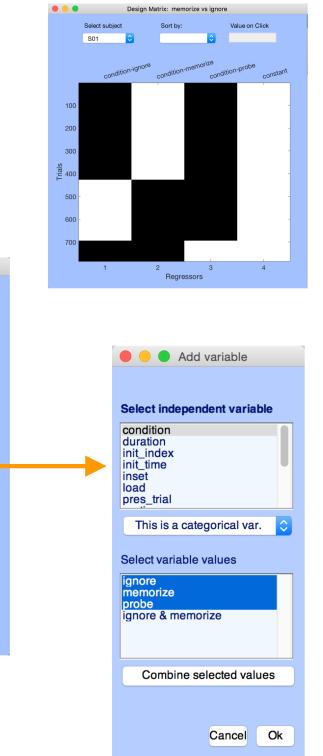
Categorical variable: condition - Values (ignore - memorize - probe

Cancel

Ok

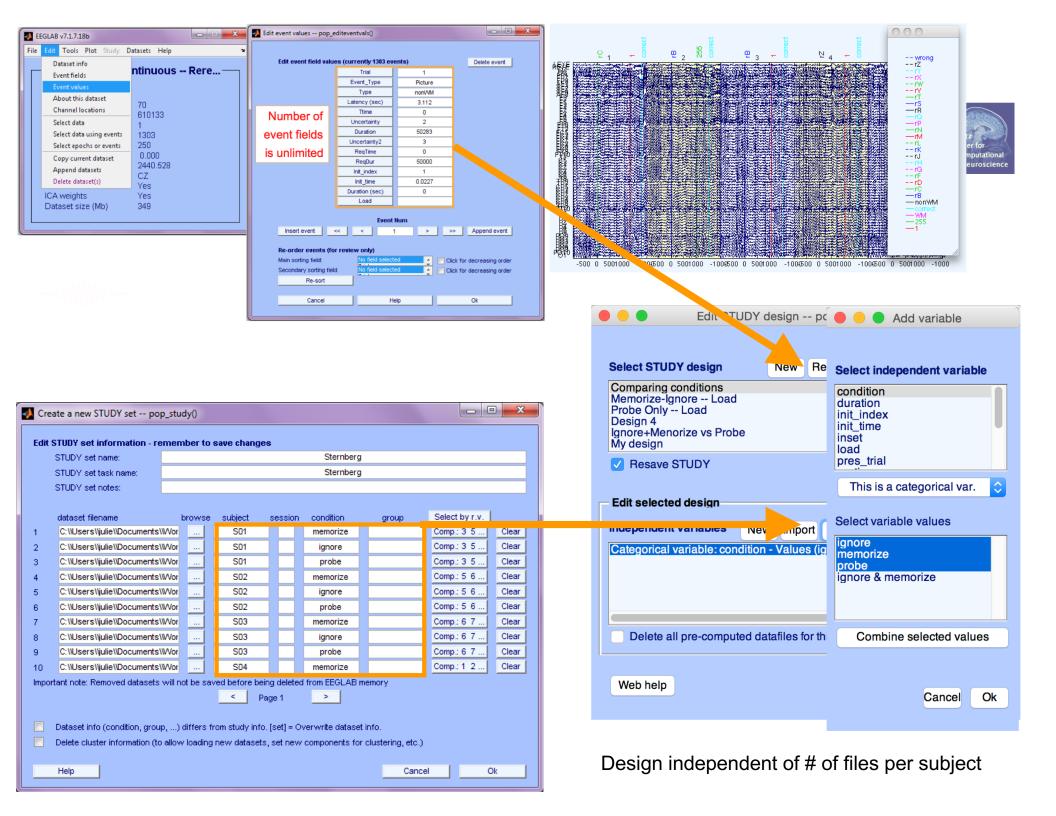
#### 1x3 design

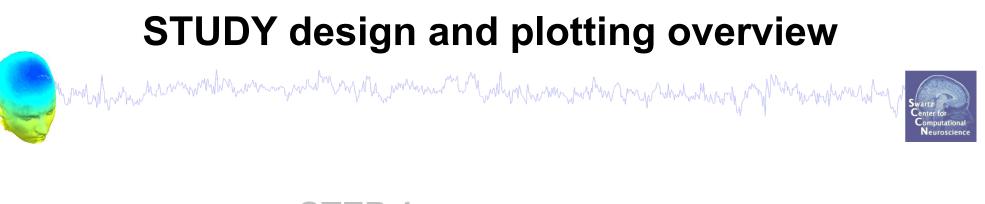




Re-save STUDY file

o help





STEP 1 **Build a STUDY STEP 2** Build design(s) **STEP 3** Precompute the data **STEP 4** Plot the data Exercise...



#### **Precompute data measures**



		E	EGLAB	v13.x (dev	/)				
File	Edit	Tools	Plot	Study	Datasets	Help			
	-STUDY s	set: Sterni	perg —		tudy info t/Edit study	design(	(s)		
	Study fi	lename: .	6/USB	Preco	mpute cha	nnel me	as	ures	
	Study ta	sk name		Plot c	hannel me	asures			
	Nb of su	bjects							
	Nb of co	nditions			mpute com	•		easures	
	Nb of se	ssions		PCA o	clustering (	original)			
	Nb of qr	oups		Edit/J	plot cluster	s			
	Epoch co	nsistency		Clust	er compon	ents by c	0	rrelation (CORRMAP)	
	Channels	per fram	e	std_E	rpCalc				
	Channel	locations		yes					
	Clusters			1					
	Status			Ready	to precluster				
	Total si	ze (Mb)		229.4					

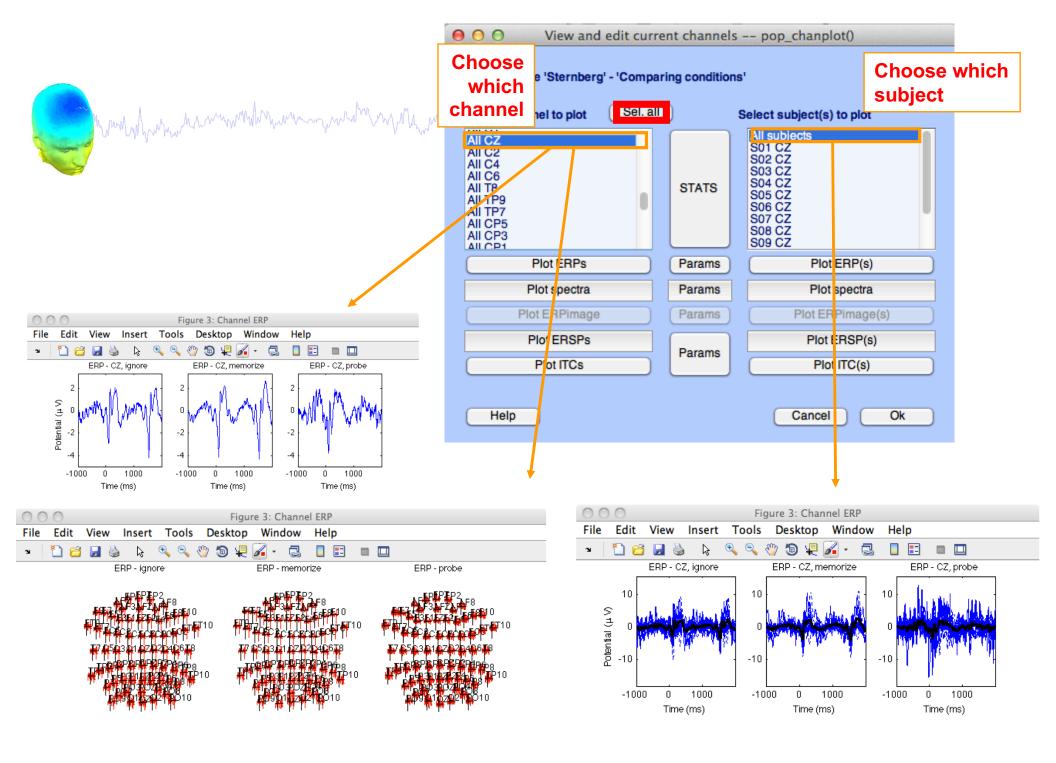
Pre-	compute channel me	asures for STUDY 'Sternberg' -	'STUDY.design 1'	
Cha	nnel list (default:all)			
☑	Spherical interpolation	n of missing channels (performed a	after optional ICA removal belo	w)
	Remove ICA artifactua	al components pre-tagged in each		
	Remove artifactual IC/	A cluster or clusters (hold shift key)	ParentCluster 1 Cls 2 Cls 3 Cls 4	0
List	of measures to preco	ompute		
	ERPs	Baseline ([min max] in ms)		
	Power spectrum	Spectopo parameters	'specmode', 'fft'	Test
	ERSPs	Time/freq, parameters	ycles', [3 0.5], 'nfreqs', 100	Test
_	Save single-trial measu Recompute even if pres	res for single-trial statistics - requir ent on disk	res disk space	
	Help		Cancel	Ok

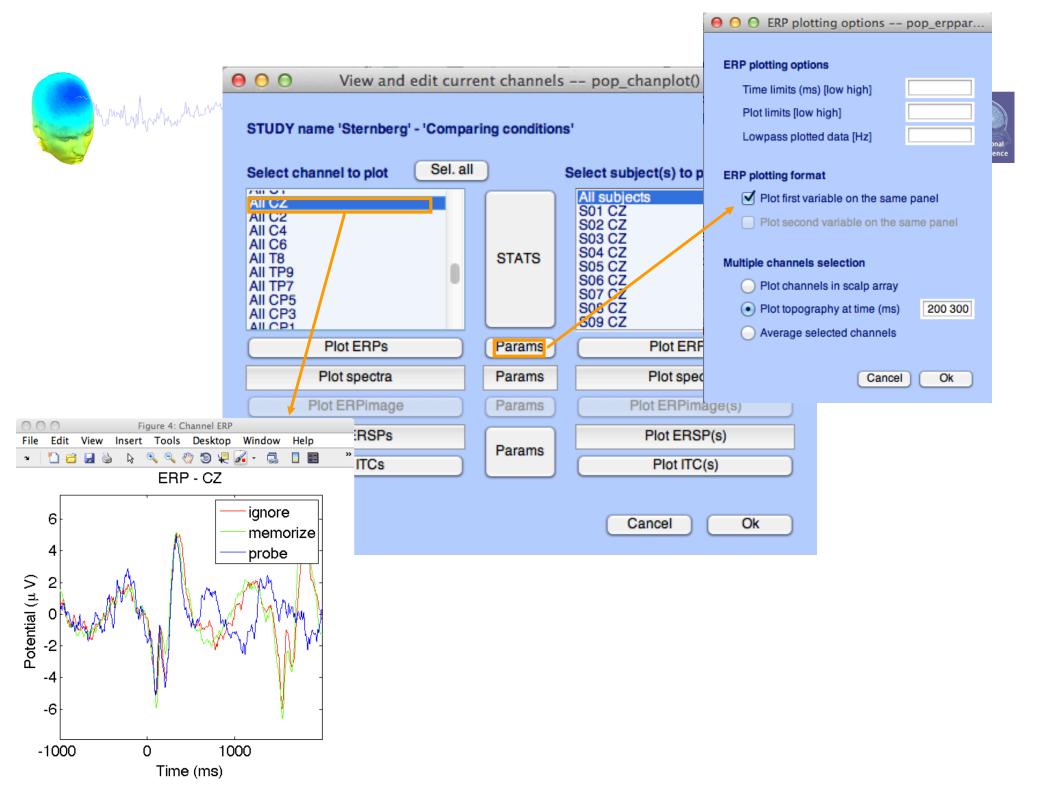
Select and compute component measures for later clustering -- pop\_precomp(

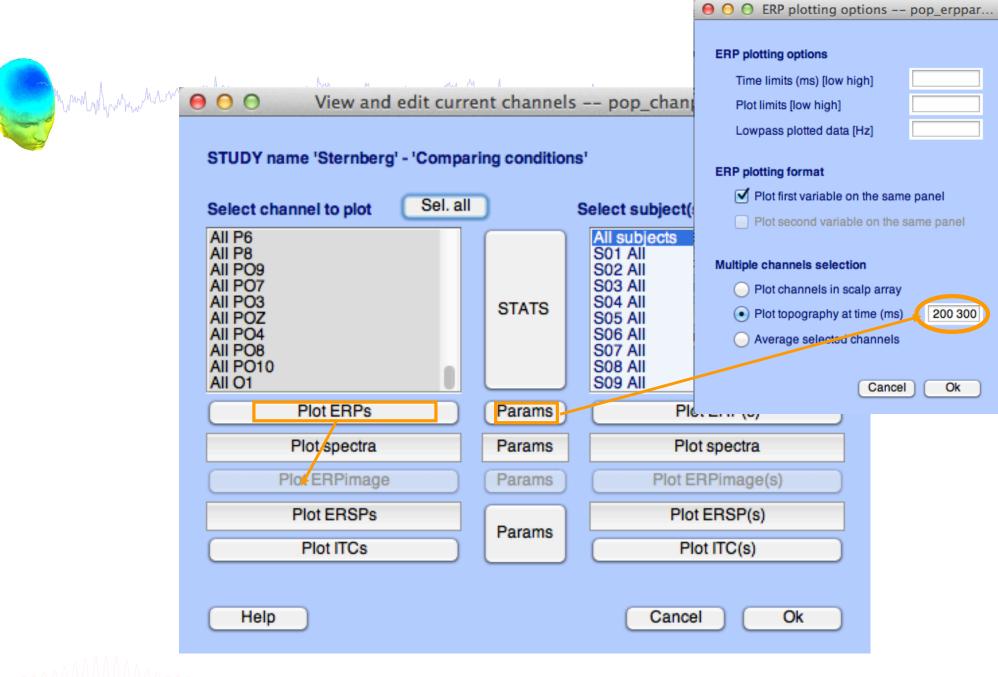
Mar Markan Marka	ww
--	----

File       Edit       Tools       Plot       Study       Datasets       Help         #3: St       Change sampling rate Filter the data Re-reference Interpolate electrodes       Image: Change sampling rate Filter the data Re-reference       Image: Change sampling rate Reference       Im	No.
Filter the data Re-reference Interpolate electrodes Channels Frames p Epochs Extract epochs	
Epochs Extract epochs	
Sampling Epoch st Run ICA Epoch en Remove components	Са
Referend Channel       Automatic channel rejection         ICA weig       Automatic epoch rejection         Dataset       Reject data epochs	
Reject data using ICA    Reject components by	y map
Locate dipoles using DIPFIT 2.x Peak detection using EEG toolbox Reject data (all methor Reject by inspection	
FMRIB Tools Locate dipoles using LORETA	
Export marks to data	reject
Reject marked epochs	5

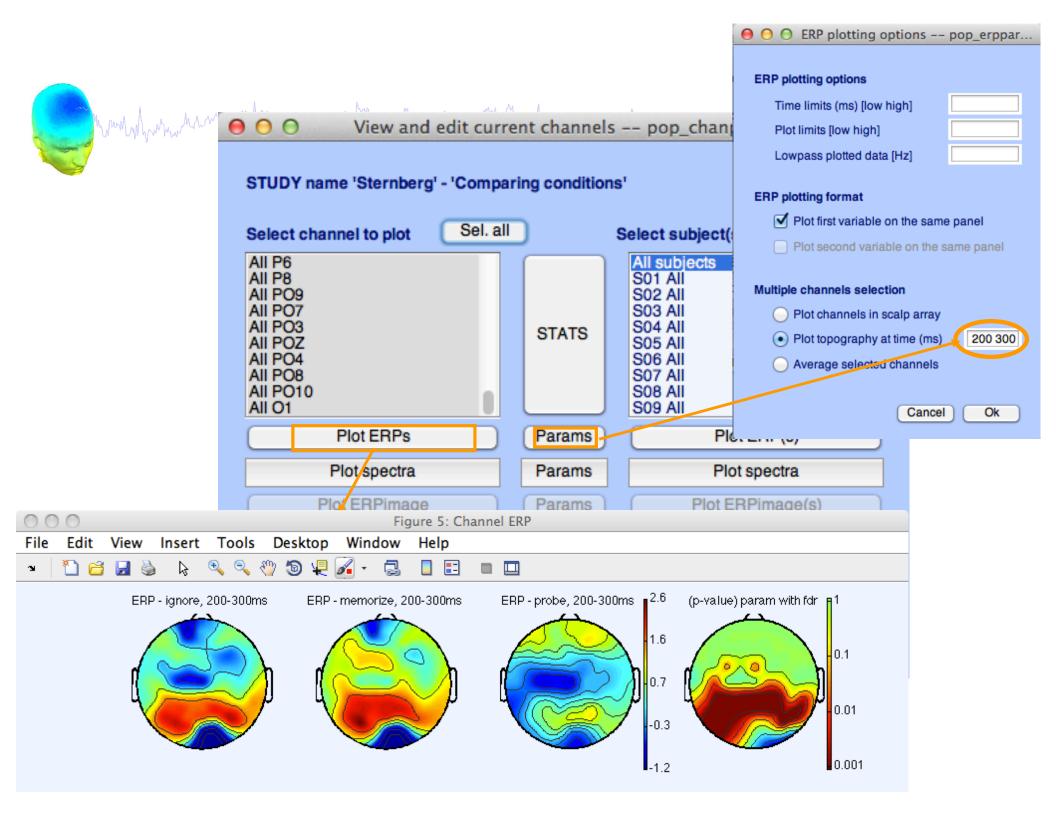
V R	eject components b			<u> Yunnin yu</u> n			×
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	29	30	31	32	33		
	17. Do	<b>FR</b>					
	The second				Ser ?		
	Cancel	Set inrehsold:	1 San anna	ward and a		Holp	ОК
	Cancer	ON DENOSOR	See comp.	. 3686 J	rojection	Help	



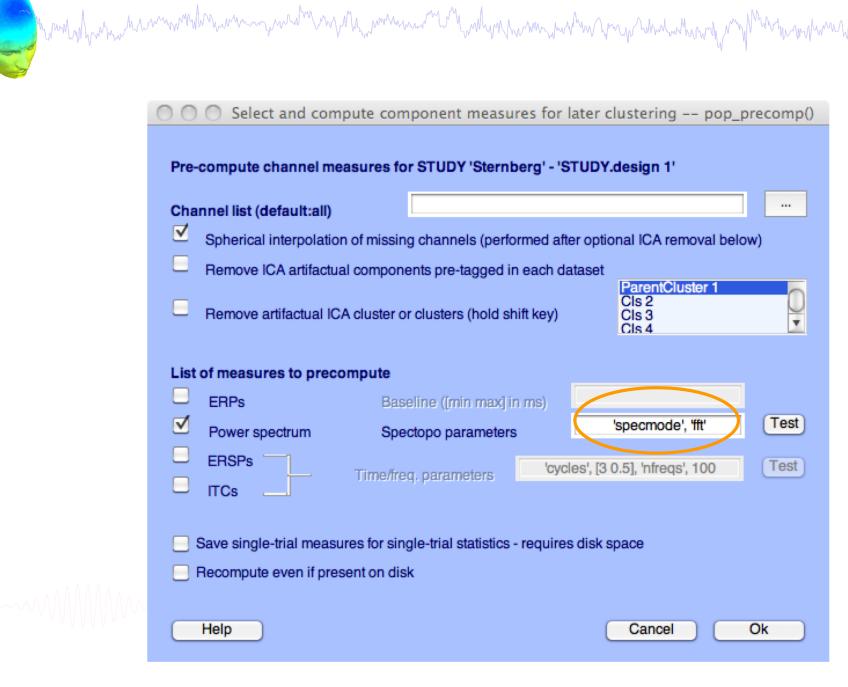




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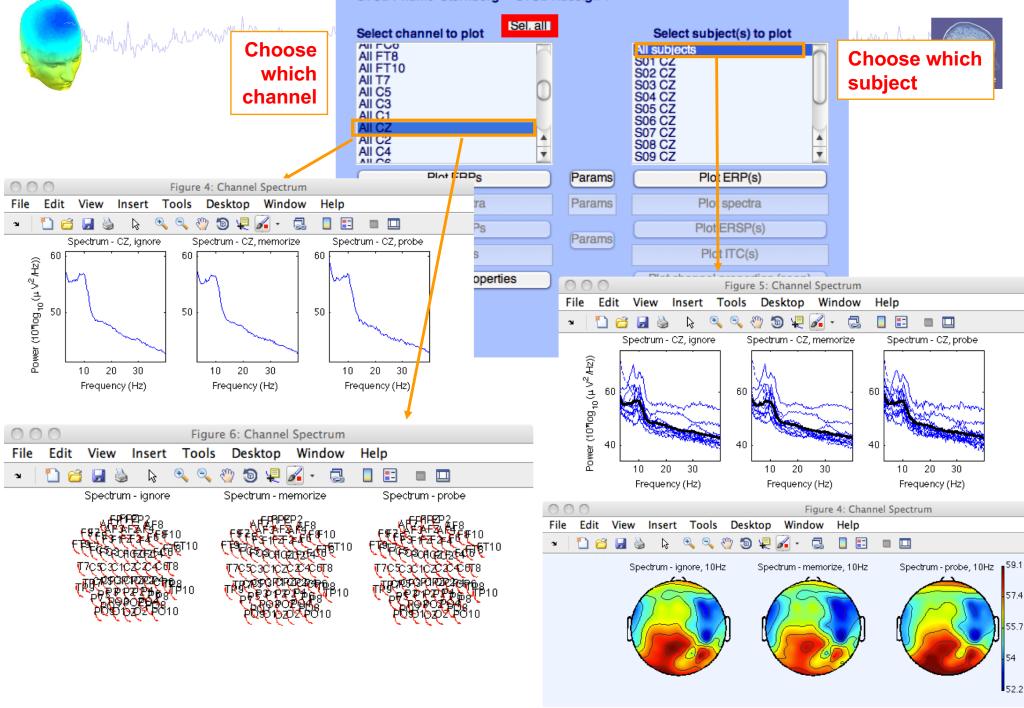
## **Computing Spectrum**



Swartz Center for Computational Neuroscience

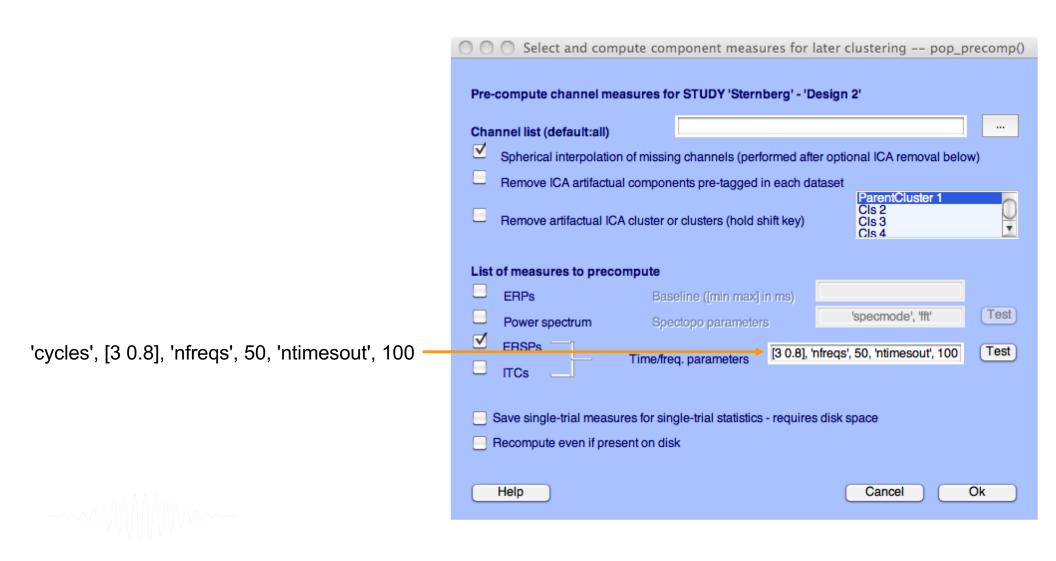
#### View and edit current channels -- pop\_chanplot()

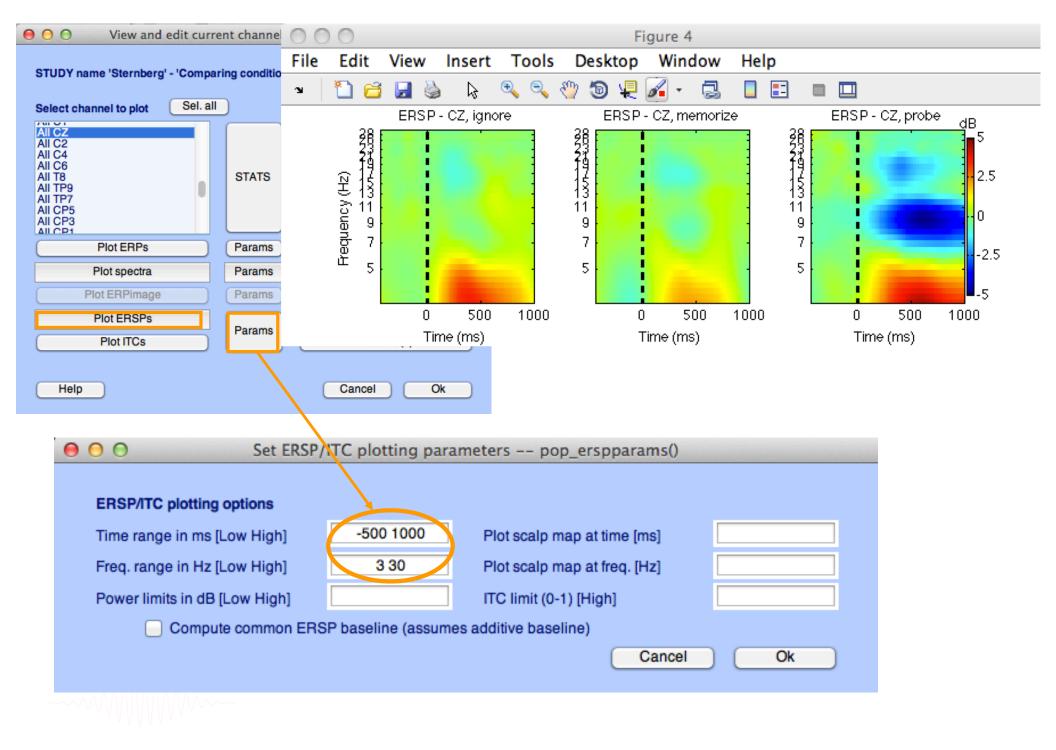
#### STUDY name 'Sternberg' - 'STUDY.design 1'



## **Computing ERSP**

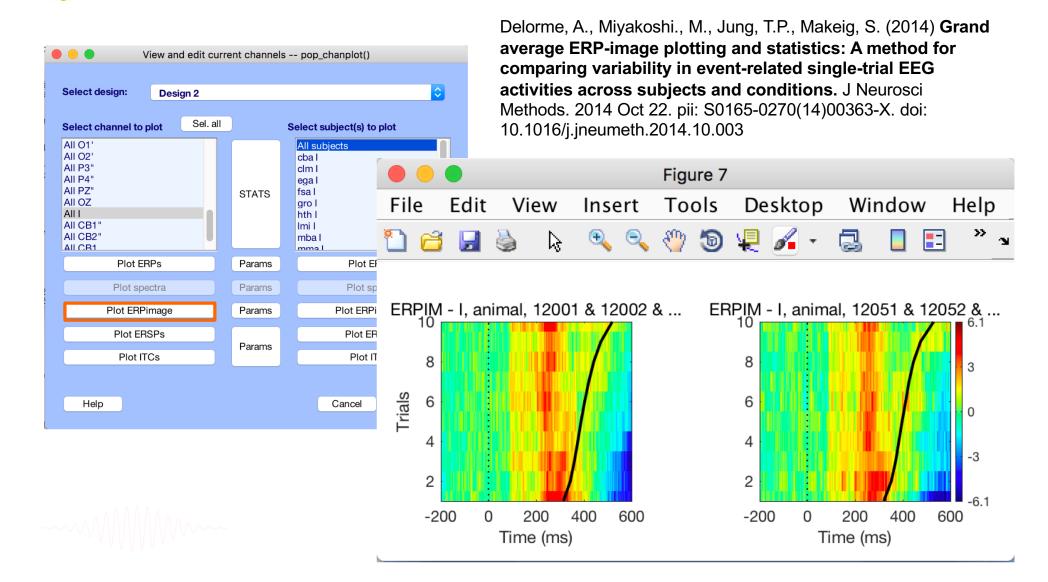
hand have a second with a second with a second with a second with a second of the seco



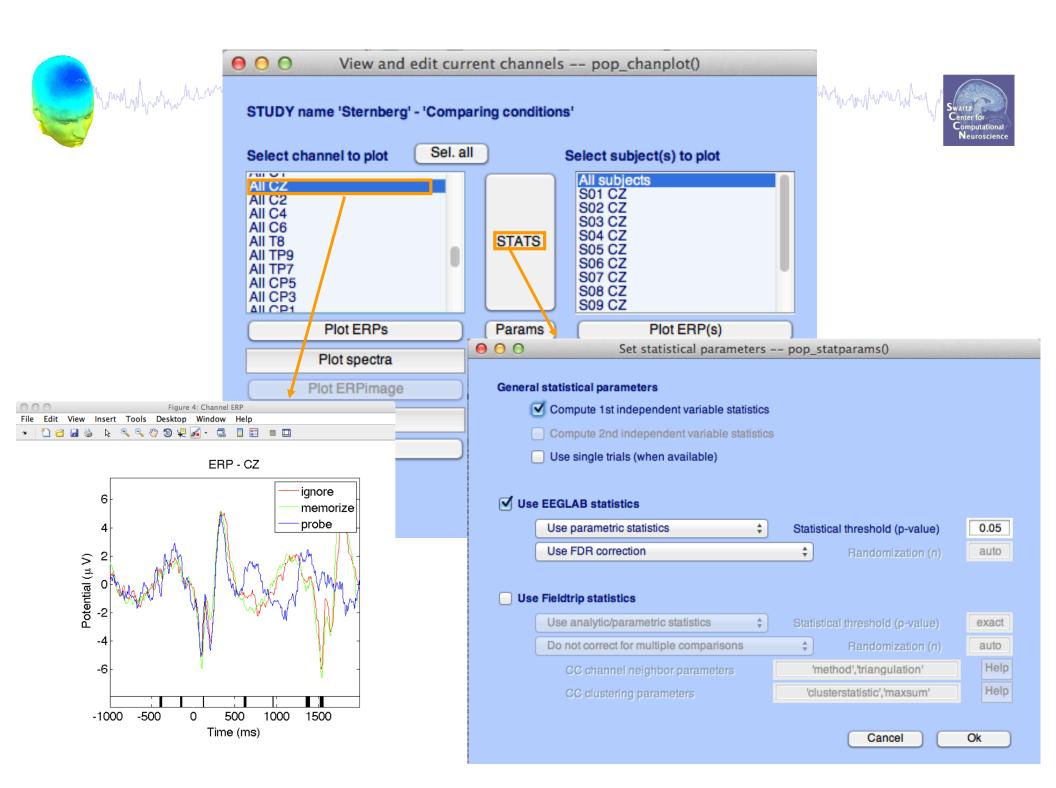


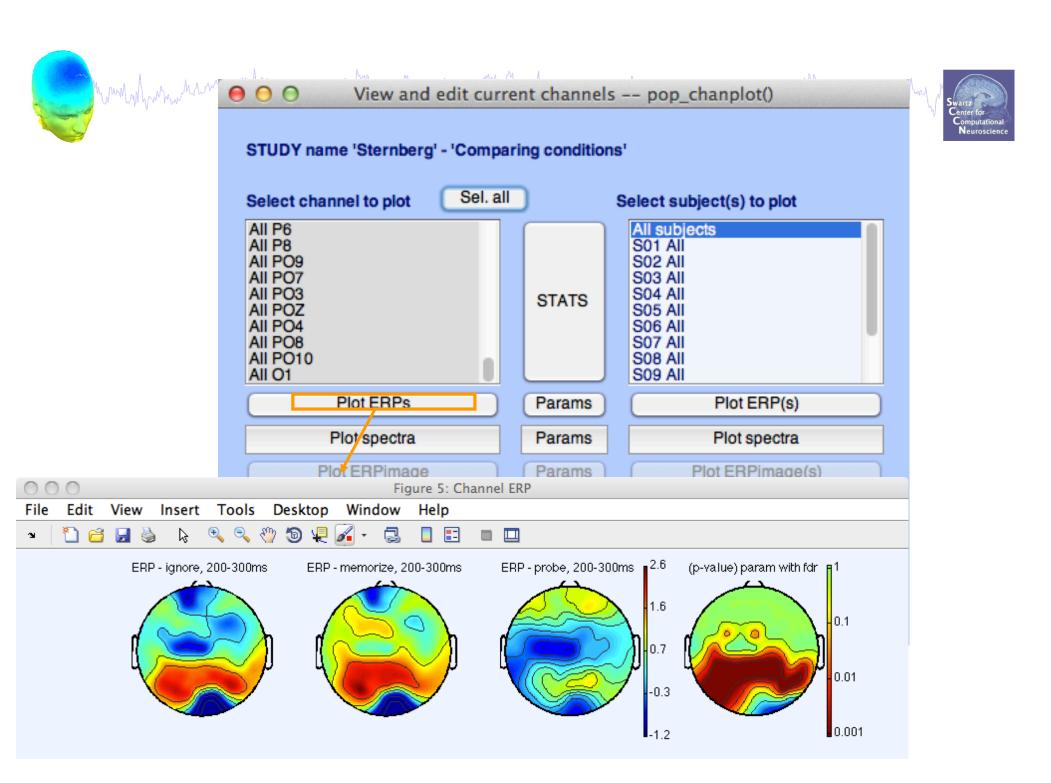
#### **ERP-image across subjects**

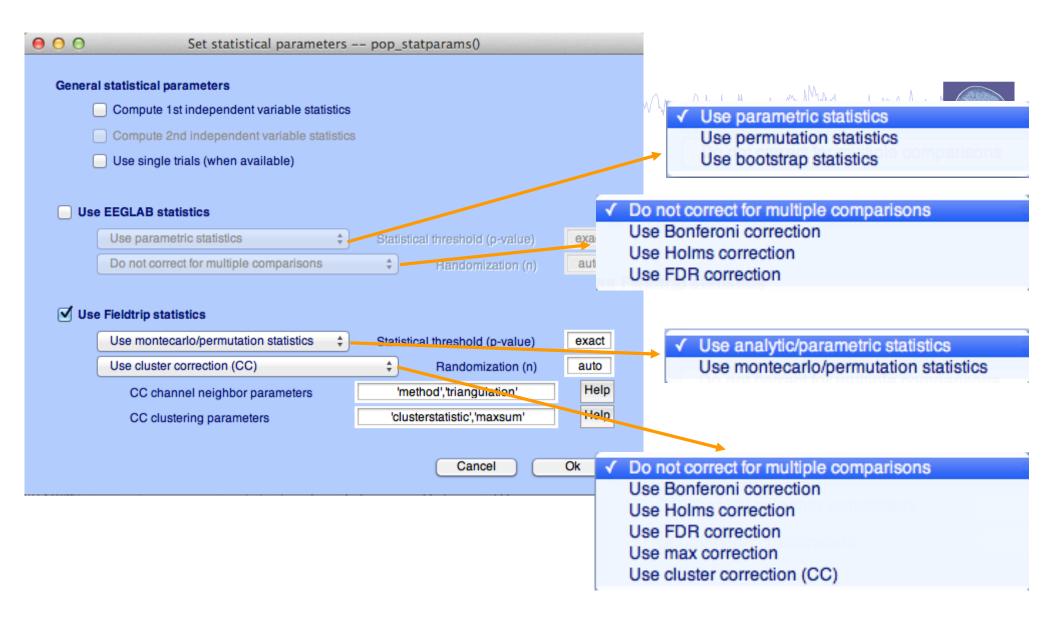
man have a second and the second and



EEGLAB Workshop XI, Sept 8-10, 2010, NCTU, Taiwan: Julie Onton - STUDY Intro







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 Cpz
- 6. Plot scalp topography at 10 Hz (spectrum) and 200-300 ms (ERP) for both conditions
- 7. Plot spectrum for electrode CPz 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<sub>25</sub>correction (Fieldtrip statistics)