

Appendix 2

Instructions for a basic semi-automated data analysis

This script (SCR_deon.m) calculates the mean SCR response in a typical fear conditioning paradigm (see (Bechara & Damasio, 2002; Syngelaki, Fairchild, Moore, Savage, & van Goozen, 2013)). First, it analyses the SCR and extracts the phasic SCR values (mean SCR and ISCR) using CDA in Ledalab. Then it compiles, summarizes data (based on 4 phases: habituation, acquisition 1, acquisition 2 and extinction) as well as produce figures that correspond to Figure 2 of (Syngelaki et al., 2013). An excel file containing three worksheets (1: Compilation of entire dataset, 2: Summary for each participant, 3: Summary of entire dataset) will be produced and saved.

An example can be found at: <https://deonlabblog.wordpress.com/research/methods/skin-conductance-for-organizational-researchers/>

Data preparation

Download the full folder with all the related files from :

<https://deonlabblog.wordpress.com/research/methods/skin-conductance-for-organizational-researchers/>

The user should put all the related files under the same directory – the *maindir*

Replace the related files in the folder Beh_data and SCR_data with your very own data files.

Data collected should be separated into two types: the SCR_Data and the behavioral data (including the timing of when each slide appears).

Assuming that the directory is located at **C:\maindir**, the user should create two folders (“Beh_Data” and “SCR_Data”).

The user should place all the behavioral data files in the folder C:\maindir\Beh_Data and all the skin conductance data files in the folder C:\maindir\SCR_Data.

Please open the file SCR_deon.m, go to line 20 and change the folderlocation accordingly

For instance, if the directory you copied all your files is at C:\maindir, then this line:

```
folderlocation = 'C:\Users\user1\Desktop\SCR_deon_sample';
```

should be changed to

```
folderlocation = 'C:\maindir\SCR_deon_sample';
```

Behavioral Data

The data should be saved as .mat files. These files are automatically generated following the execution of the experiment script (Appendix 1). Each participant should have his/her own file in the form of 8810XXX_beh.mat (where XXX is the subject’s ID number). No other files should be in this folder.

During the SCR_Data collection process, the user should aim to name the channels used in the following manner. The channel for the SCR_Data should be named “EDA”. The channel for the TTL signal (signal from matlab to indicate trial progress) should be named “EVENT”. The images in Appendix 1 show how this can be done in Acquisition 4.1 – the software platform for Biopac systems.

Skin Conductance Data

The data should be saved as .acq files. Other file formats (.mat) should also work if they are outputs obtained directly from the skin conductance collection interface. Each participant should have their own file in the form of 8810XXX_data.mat (where XXX is the subject's ID number). No other files should be in this folder.

User Input

After opening SCR_deon.m, there are several options (from line 13 onwards) that the user can change before executing the script. Below is the detailed list:

A dummy variable to indicate if the user wishes to perform a CDA using Ledalab:

```
SCR = 1;
```

If the user has previously performed analysis on this dataset, the SCR value can be set to any value not equal to 1. If the SCR value is 1, the program will perform the Ledalab analysis on the SCR_Data. Otherwise it will use the outputs from Ledalab for the rest of the analysis.

The sample rate that the data is collected in:

```
sampleHz = 500;
```

In subsequent lines, the script defines other input parameters (Lines 25 to 49) used in the Ledalab analysis; the user should edit these only if they are confident (for more details on acceptable inputs, refer to www.ledalab.de/documentation).

After editing the inputs, the user should then execute the script (by running it or pressing F5). The script should run smoothly if the instructions are followed. Please run the scripts with our very own files as a pretest to ensure that it runs smoothly on your system – if it does not, then probably there are compatibility issues. As such problems may emerge, users are encouraged to communicate with the authors at the contact details indicated at <https://deonlabblog.wordpress.com/contact-us/>. This version has been tested on Matlab 2016a for Windows 7.

Output

The script produces various outputs. The Ledalab component produces a .mat file with the results following the deconvolution for each subject. These can be found in the SCR_Data folder (e.g. 8810002_data_era.mat). An excel file (data.xls) is also produced. The first sheet of the excel file contains the compilation of all trials from each participant. The second sheet contains the summary of the SCRs in different phases (each column is a different phase) for each participant (each row is a different participant). The final sheet contains the grand mean of SCRs in different phases across all participants (row 1) and their standard errors (row 2).

Additionally, the script also generates a graph similar to Syngelaki et al. (2013).

To identify differences between two groups, the researcher could take the responses and subject them to mixed ANOVA analyses with group as a between-subject factor and phases and stimulus type as within-subject factor, separate repeated measures ANOVAs and post-hoc main effect comparisons between groups.

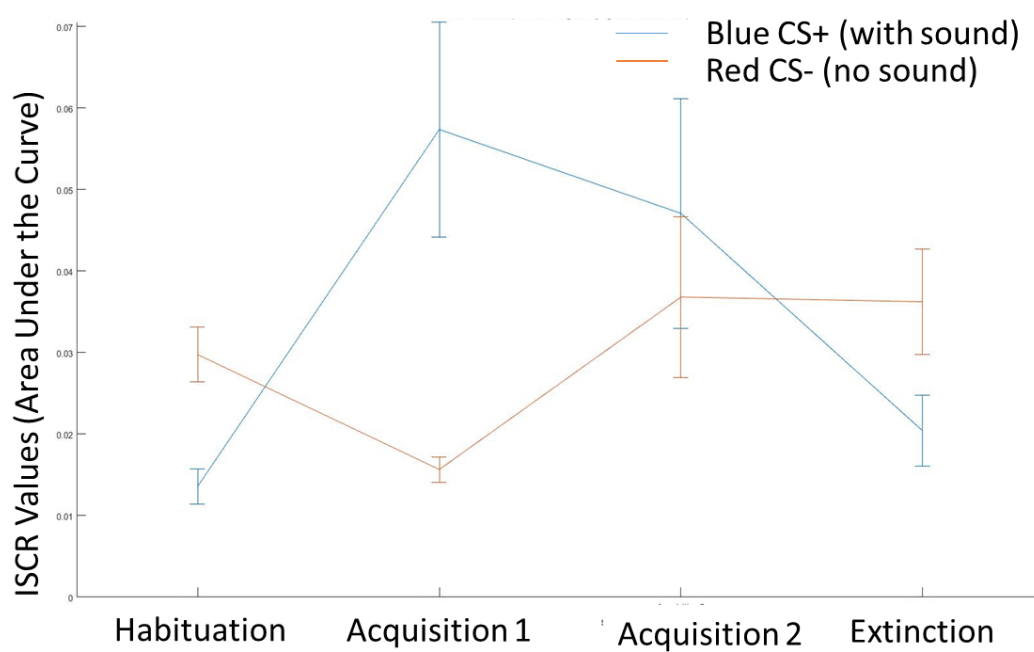


Fig 2A: Sample output of data. Error bars represent standard error of measurement.

References

- Bechara, A., & Damasio, H. (2002). Decision-making and addiction (part i): Impaired activation of somatic states in substance dependent individuals when pondering decisions with negative future consequences. *Neuropsychologia*, 40(10), 1675-1689.
- Syngelaki, E. M., Fairchild, G., Moore, S. C., Savage, J. C., & van Goozen, S. H. (2013). Fearlessness in juvenile offenders is associated with offending rate. *Dev Sci*, 16(1), 84-90. doi: 10.1111/j.1467-7687.2012.01191.x