scrSRASA: Skin Conductance Response and Social Rehearsal Account of Smartphone Addiction

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Global project: https://osf.io/kq2jh/

id refers to participant identification.

source files:

- *key.csv*
- *scr.Data*
- *eform.xlsx*

Folders

dat

It contains original data files. It also contains two folders. Here are their names and descriptions.

- indat: it contains intermediate data files.
- scales:

stx

It contains pieces of code to run specific ordered tasks.

tbl

It contains tables summing up analyses.

fig

It contains the figures produced.

Files

Data files

key.csv

It contains experimental group assignation for each participant.

Variables and labes:

- id: participant identification.
- eg: experimental group assignation.
  - Exp: experimental group. Participants into this group were induced to experience social interaction expectancy.
  - Con: control group. Participants into this group were not induced to experience social interaction expectancy.

scr.RData

It contains two R objects (matrices) where skin conductance responses can be found for each participant.

Object name and brief description.

- bl1: base line, 120 seconds recording of skin conductance response before the distraction virtual reality task.
- sp1: 360 seconds of skin conductance response recording after virtual reality task. During the first 120 seconds participants were in resting state, during the intermediate 120 seconds participants were using their smartphones in a typical fashion, and during the last 120 seconds participants were in resting state again.

nscr.RData

It is an R data file environment containing one object. It contains standardized net skin conductance activation. To standardize, mean and standard deviation was taken from baseline record before the distraction virtual reality task. This is the name object and the labels for each variable contained in it.

- zsc1: it is the standardized net skin conductance response for each participant during 360 seconds after the distraction virtual reality task. It contains the following variables:
  - id: participant identification.
  - s1 to s360: second from 1 to 360.

eform.rds

It contains answers to the recruitment electronic form. These are the labels and description for each variable:

- id: participant identification code.
- sex: it refers to participant's self assignment to woman (0) or man (1) categories.
- edad: age computed from birth date to experiment date.
- not: the apps constalty activated in participant smartphone.
- sav1 to sav10: items from the Smartphone Addiction Scale - Short Version (Kwon et al., 2013).

Source code files

scrSRASA_master.R

Main source code file. It can be used to run all the analysis.

01_scrscores.R

It computes skin conductance response scores. It generates the *nscr.RData* data file.

02_ts.R

It processes SCR time series. It generates graphs (see "fig" folder) and the *bk.csv* table (see "tbl" folder).

03_scr_peaks.R

It processes SCR time series to extract basic peak features (Vila Castellar and Guerra Muñoz, 2009). It produces the file *pas.csv* archived in *tbl* folder.

04_eform.R

It imports data from the electronic form (*eform.xlsx*). It produces the file *eform.rds* archived in *indat* folder.

Table files

bk.csv

It contains statistics to sum up the time series for control and experimental group. The semicolon was used to separate columns and the comma was used as the decimal delimiter. Several Bayes Factors were computed to test sensitivity to prior specification by following the recommendations provided by Kruschke (2021). Dissimilarity between time series were computed using cross-correlation based distances Montero and Vilar, 2014. These are the labels for each column:

- The first column (with no heading) refers to seconds in time series.
- mean: mean difference favouring skin conductace response to experimental group as compared with control group.
- ll: 95% confidence interval lower limit for mean estimation.
- ul: 95% confidence interval upper limit for mean estimation.
- t: t-value comparing the mean with the null hypothesis of zero difference.
- df: degrees of freedom for t.
- pv: p-value for t.
- bfs.l: Bayes Factor comparing observed mean to zero value. Prior fixed at $\frac{\sqrt{2}}{4}$.
- bfs.m: Bayes Bayes Factor comparing observed mean to zero value. Prior fixed at $\frac{\sqrt{2}}{2}$.
- bfs.w: Bayes Factor comparing observed mean to zero value. Prior fixed at 1.
- bfs.u: Bayes Factor comparing observed mean to zero value. Prior fixed at $\sqrt{2}$.
- dts: distance between raw points in time series for experimental group and control group considering both proximity and temporal behavior.
- r2: r^2 effect size estimation based on observed t and computed as $\frac{t^2}{t^2+df}$ where *df* refer to degrees of freedom.

pas.csv

It contains peak analysis statistics computed after smoothing SCR time series. This is the label and description of each column:

- id: participant identification code.
- eg: experimental group, Exp = experimental, Con = control.
- amp.su: peak amplitude during smartphone usage.
- amp.sw: peak amplitude after smartphone withdrawal.
- rt.su: peak rise time during smartphone usage.
- rt.sw: peak rise time after smartphone withdrawal.
- tr50.su: 50% peak recovering time during smartphone usage.
- tr50.sw: 50% peak recovering time after smartphone withdrawal.

Figure files

scr.pdf

It compares SCR for control and experimental group during 360 seconds.

ex_co_ts.pdf

It is the net time series resulting from subtracting the control group time series to experimental time series.

sbk.pdf

It is analogous to *ex_co_ts.pdf* but it cluster the time series into 30 seconds bins. Average SCR estimation for each block and the 95% confidence interval are plotted.

References

- Kruschke, J. K. (2021). Bayesian analysis reporting guidelines. *Nature Human Behavior*, *5*, 1282-1291. https://doi.org/10.1038/s41562-021-01177-7
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- Montero, P., and Vilar, J. A. (2014). TSclust: An R package for time series clustering. *Journal of Statistical Software, 62*, (1). https://doi.org/10.18637/jss.v062.i01
- Vila Castellar, J., and Guerra Muñoz, P. (2009). *Introducción a la psicofisiología clínica.* Síntesis.