README CODE
Beat the Mean: Evaluating the Incremental Explanatory Power of Emotion Dynamic Measures in Psychological Well-being.

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Abstract

All the code necessary to replicate the paper ' Beat the Mean: Evaluating the Incremental Explanatory Power of Emotion Dynamic Measures in Psychological Well-being.' can be found in this package. The code has been written and tested partially in Matlab [3]. In the following sections we elaborate on the data included and on the important code files.

1 Data

This replication package includes two example data sets:

- The 'Koval et al.' data set as described in the main text [2].
- The 'Kalokerinos et al.' data set as described in the main text [1].

Both data sets only include regression outcomes. No example data set is included for the classification outcome code. **The results found by using these example data files do not always resemble the results from the paper.** For example, these two data sets are almost the only two data sets where we find a significant effect of the autoregressive component over the mean and the SD. Both data set only include satisfaction with life and depression outcomes.

1.1 Use for own data

All data sets have to be in the same format as the example data files. For a data set named 'DataName' you need

- **'DataName.csv'**: a csv file with header, where decimals are written with a dot(for example 4.14) and with separator semicolon (;) :

  - First column: The participant ID
  - Second column: The so called unit. For example the day. Autoregressive components and MSSD are only computed for time points within the same unit.
  - Third column: occasion. This refers to a single measurement occasion (i.e., a beep in a ESM protocol or a daily questionnaire in a daily diary study). Needs to be successive in order otherwise errors will be produced. Autoregressive components and MSSD only use occasions with a difference off one (occasion t is regressed only on occasion $t-1$),
  - Column four and five: PA (average of emotions with positive valence) and NA (average of emotions with negative valence)
  - Column six to ?: All the individual emotions.
- **'DataName bound.csv'**: a csv file with header, where decimals are written with a dot (for example 3.14) and with separator semicolon (;). This file has two columns and one row (in addition to the header). The first cell is the minimum possible measurement of all emotions and the second cell is the maximum possible measurement of all emotions.
- **'DataName val.csv'**: a csv file with header, where decimals are written with a dot (for example 3.14) and with separator semicolon (;). This file has one row (in addition to the header). There is one column for each emotion. This file indicates the valence of each emotion: 1 for positive emotions and -1 for negative emotions.
- **'DataName reg.csv'**: this file is optional for continuous or regression outcomes: a csv file with header, where decimals are written with a dot (for example 3.14) and with separator semicolon (;).
  - Column one: The participant ID.
  - Column two to ?: One column for each outcome.
- **'DataName class.csv'**: this file is optional for classification: a csv file with header, where decimals are written with a dot (for example 4.14) and with separator semicolon (;).
  - Column one: The participant ID.
  - Column two to ?: One column for each outcome. Each column only contains 1 or 0.
- **'DataName cov.csv'**: this file has all the data set dependent covariates: a csv file with header, where decimals are written with a dot (for example 4.14) and with separator semicolon (;).
  - Column one to ?: One column for each covariate.

2 INITIALISE.m

In this file all data sets are loaded. The data sets have to be in the same format as the example data files as described in Section 1. Then all dynamic measures are computed for each data set.

3 CORRELATIONS.m

In this file, all dynamic measures are correlated to each other over all data sets.

4 PCA.m

In this file, a varimax PCA analysis, including parallel analysis, is executed for all indices over all data sets.

5 UNIQUENESS.m

In this file, we compute how unique each dynamical measure is, when related to the mean and the standard deviation.

6 FREQUENTIST_ANALYSIS.m

In this file all dynamical measures are individually , above the mean and above the mean and the standard deviation, regressed to all possible outcomes, for each data set. For continuous outcomes this is done with a linear regression and a mixed model linear regression, for classification outcomes this is done using a mixed model logistic regression. Then we compute several R^2 measures for each regression. Finally we also show the results of a meta analysis.

7 LASSO.m

In this file the predictive power of the dynamic measures is tested using cross-validation and lasso. First linear regression is used for continuous outcomes and then, logistic regression is used for classification outcomes.

References

[1] E. Kalokerinos, E. K. Tamir, and P. Kuppens. Motivated emotion regulation in daily life.

[2] P. Koval, M. L. Pe, K. Meers, and P. Kuppens. Affect dynamics in relation to depressive symptoms: variable, unstable or inert? *Emotion (Washington, D.C.)*, 13(6):1132–1141, Dec. 2013.

[3] MATLAB. *version 9.1.0.441655 (R2016b)*. The MathWorks Inc., Natick, Massachusetts, 2016.