Can we trust our numbers? Quantification of measurement reliability for intensive longitudinal data (GPMU/22/014)

A Data Management Plan created using DMPonline.be

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Project abstract:

In many scientific domains, like medical and psychological sciences, technical advances led to the development of devices that can record biological, physical, behavioural or environmental information in real time. Recordings can be passive (e.g., sensors) or active (e.g., questionnaires sent on a smartphone). These devices offer the possibility to study individuals in real-time and real-life settings. They generate intensive longitudinal data (ILD) on one or more variables (e.g., heart rate and stress level). ILD are characterized by many observations very close in time. Reliability and agreement studies contribute to assessing the quality of measurement instruments by providing information about the amount of error inherent to any diagnostic, score or measurement. Unfortunately, no encompassing statistical framework with clear guidelines and a user-friendly software tool exists to study the reliability and agreement for ILD. In this doctoral project, we propose to develop general Bayesian state-space models to assess reliability and agreement for ILD. The framework will be developed for a wide range of outcomes (binary, Gaussian and bounded) and implemented in a free statistical software. We further propose to empirically validate how model assumptions affect reliability and agreement. Based on the findings, guidelines to assess reliability and agreement for ILD will be formulated. This doctoral project will provide a solid statistical framework with large potential impact, given the increased use of mobile technology innovations and the lack of methods to assess their reliability and agreement.

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Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.

Dataset name / ID	Description	New or reuse	Digital or Physical data	Data Type	File format	Data volume	Physical volume
Data from Koval, P., Pe, M. L., Meers, K., & Kuppens, P. (2013). Affect dynamics in relation to depressive symptoms: Variable, unstable or inert? *Emotion*, *13*, 1132-1141. https://doi.org/10.1037/a0033579	ESM data	*E(xisting data)*	Digital data	numerical data	SPSS *.sav file	<1GB	

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:

Koval, P., Pe, M. L., Meers, K., & Kuppens, P. (2013). Affect dynamics in relation to depressive symptoms: Variable, unstable or inert? *Emotion*, *13*, 1132-1141. https://doi.org/10.1037/a0033579

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? If so, refer to specific datasets or data types when appropriate and provide the relevant ethical approval number.

- Yes, human subject data (Provide SMEC or EC approval number below)

Ethical approval has been obtained, however given the fact that this was 10+ years ago (with a much different way of working with the SMEC) I do not have the approval number.

Will you process personal data? If so, please refer to specific datasets or data types when appropriate and provide the KU Leuven or UZ Leuven privacy register number (G or S number).

- Yes (Provide PRET G-number or EC S-number below)

see comments above

Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, …)? If so, please comment per dataset or data type where appropriate.

- No

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material or Data transfer agreements, Research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.

- No

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.

- No

Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keepdata understandable and usable, for yourself and others, now and in the future (e.g. in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, codebook.tsv etc. where this information is recorded).

The data are documented and stored by Peter Kuppens.

Will a metadata standard be used to make it easier tofind and reuse the data?
If so, please specify which metadata standard will be used.

If not, please specify which metadata will be created to make the data easier to find and reuse.

- No

Data Storage & Back-up during the Research Project

Where will the data be stored?

- Other (specify below)
- OneDrive (KU Leuven)

The data will be used by PhD candidate Tzu-Yao Lin who is currently working at Maastricht University in the context of his global PhD project. At the same time, the data will be synchronized to OneDrive (Tzu-Yao's KU Leuven account).

How will the data be backed up?

- Other (specify below)

Maastricht university backup systems.

Is there currently sufficient storage & backup capacity during the project?

If no or insufficient storage or backup capacities are available, explain how this will be taken care of.

- Yes

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

Maastricht university measures.

What are the expected costs for data storage and backup during the research project? How will these costs be covered?

The responsibility of the collection of the data lies with Peter Kuppens.

Data Preservation after the end of the Research Project

Which data will be retained for 10 years (or longer, in agreement with other retention policies that are applicable) after the end of the project?

In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).

- All data will be preserved for 10 years according to KU Leuven RDM policy

Where will these data be archived (stored and curated for the long-term)?

- Other (specify below)

Responsibility of Peter Kuppens. The data are stored in https://emotedatabase.com/datasets/23

What are the expected costs for data preservation during the expected retention period? How will these costs be covered?

Costs will be covered by our research group. The data are stored in https://emotedatabase.com/datasets/23

Data Sharing and Reuse

Will the data (or part of the data) be made available for reuse after/during the project?
Please explain per dataset or data type which data will be made available.

- Other (specify below)

The data are already available through https://emotedatabase.com/datasets/23.

If access is restricted, please specify who will be able to access the data and under what conditions.

Not applicable.

Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)?

Please explain per dataset or data type where appropriate.

- No

Where will the data be made available?

If already known, please provide a repository per dataset or data type.

- Other (specify below)

The data are stored in https://emotedatabase.com/datasets/23

When will the data be made available?

- Other (specify below)

The data are stored in https://emotedatabase.com/datasets/23

Which data usage licenses are you going to provide?

If none, please explain why.

- Other (specify below)

No information.

Do you intend to add a persistent identifier (PID) to your dataset(s), e.g. a DOI or accession number? If already available, please provide it here.

- No

What are the expected costs for data sharing? How will these costs be covered?

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Responsibilities

Who will manage data documentation and metadata during the research project?

The data are stored in https://emotedatabase.com/datasets/23

Who will manage data storage and backup during the research project?

The data are stored in https://emotedatabase.com/datasets/23

Who will manage data preservation and sharing?

The data are stored in https://emotedatabase.com/datasets/23

Who will update and implement this DMP?

Tzu-Yao Lin and F