Metacognitive Insight into Latent Cognitive Parameters

A Data Management Plan created using DMPonline.be

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Project Administrator: Kobe Desender

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Project abstract:

The ability to evaluate one's own decision-making, known as metacognition, is critical for successful adaptation in noisy, changing environments. However, it is still unclear whether humans have metacognitive insight into the underlying cognitive parameters that shape their decisions. Such insight would be particularly useful for optimizing decision-making strategies when different latent parameters, such as response bias or impulsivity, lead to incorrect choices. In this project, we aim to
address this question by investigating whether humans can accurately monitor and regulate the cognitive parameters that influence their decision-making, and whether this ability leads to more adaptive decision-making behavior. We will also explore the neural mechanisms that support metacognitive insight into latent cognitive parameters. Our findings may shed light on the
fundamental processes underlying decision-making and inform the development of interventions aimed at improving metacognitive abilities.

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Metacognitive Insight into Latent Cognitive Parameters
DPIA

DPIA

Have you performed a DPIA for the personal data processing activities for this project?

- No

Metacognitive Insight into Latent Cognitive Parameters
GDPR

GDPR

Have you registered personal data processing activities for this project?

- No

Metacognitive Insight into Latent Cognitive Parameters
Application DMP

Questionnaire

Describe the datatypes (surveys, sequences, manuscripts, objects …) the research will collect and/or generate and /or (re)use. (use up to 700 characters)

In all three work packages, participants will make choices about random dot motion or about a slot machine and afterwards provide a metacognitive rating on a continous scale. Depending on the experiment the metacognitive rating will be about the level of bias, the level of caution, the level of difficulty or the level of exploration-exploitation. Apart from these variables (choices, decision time and metacognitive ratings) and specific demographics (age, gender, handedness), no further information will be collected. In WP3 we will additionally collect EEG recordings. All data will be anonymized, so that data cannot be traced back to individual participants.

Specify in which way the following provisions are in place in order to preserve the data during and at least 5 years after the end of the research? Motivate your answer. (use up to 700 characters)

A. Kobe Desender will be responsible for preserving these data up to at least 5 years after the research.
B. All data will be saved locally on an encrypted hard-disk. In addition, after publication of a manuscript, the data will be published on an open repository (e.g., osf.io) allowing reuse by other researchers. Importantly, when signing the informed consent participants will have to agree that their (anonymized) data can be shared openly.

What’s the reason why you wish to deviate from the principle of preservation of data and of the minimum preservation term of 5 years? (max. 700 characters)

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Are there issues concerning research data indicated in the ethics questionnaire of this application form? Which specific security measures do those data require? (use up to 700 characters)

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Which other issues related to the data management are relevant to mention? (use up to 700 characters)

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Metacognitive Insight into Latent Cognitive Parameters
FWO DMP (Flemish Standard DMP)

1. 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.

				Only for digital data	Only for digital data	Only for digital data
Dataset Name	Description	New or reused	Digital or Physical	Digital Data Type	Digital Data format	Digital data volume (MB/GB/TB)
WP1	insight in DDM	*Generate new data*	*Digital*l	Experimental Simulation data	*.csv*	*500 kb*
WP2	insight in RL	Generate new data	Digital	Experimental Simulation data	.csv	500 kb
WP3	Neurophysiology	Generate new data	Digital	Experimental Simulation data Neurophysiological data (EEG + pupil)	.csv .eeg .mat	500 kb 25 GB 5 GB

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:

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Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? Describe these issues in the comment section. Please refer to specific datasets or data types when appropriate.

- Yes, human subject data

All work packages involve basic perception experiments including metacognitive judgments in which participants are not exposed to specific threats or danger. Nevertheless, we will apply for ethical approval before initiating of each WP.

Will you process personal data? If so, briefly describe the kind of personal data you will use in the comment section. Please refer to specific datasets or data types when appropriate.

- Yes

We will only collect handedness, age and gender in all three WPs. Apart from that we will not collect any personal data.

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/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

2. Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keep data 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).

For all WPS a codebook will be generated containing study design, sampling methodology, variable-level information (label, meaning of the different values, meaning of the EEG triggers). Also steps taken to remove direct identifiers in the data will be described.

Will a metadata standard be used to make it easier to find and reuse the data? If so, please specify (where appropriate per dataset or data type) which metadata standard will be used. If not, please specify (where appropriate per dataset or data type) which metadata will be created to make the data easier to find and reuse.

- Yes

For EEG and pupil data, we will use the BIDS (Brain Imaging Data
Structure; https://bids.neuroimaging.io/) format, a standardized way of organizing neuroimaging and behavioral data. In addition, all behavioral data will be added to the Confidence Database (https://osf.io/s46pr/) a large open-access database of confidence studies spanning a broad set of paradigms, participant populations and fields of study. The data from each study are structured in a common, easy-to-use format, and so data will be structured in that format.

3. Data storage & back-up during the research project

Where will the data be stored?

The time-stamped master copy of the data will be kept on our research unit central storage facility. Copies can be made and kept on personal devices.

How will the data be backed up?

The data will be stored on the university's central servers with automatic daily back-up procedures

Is there currently sufficient storage & backup capacity during the project? If yes, specify concisely.
If no or insufficient storage or backup capacities are available, then 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?

The KU Leuven provides sufficient free storage space and backup capacity for its researchers (up to 3T per researcher), which is more than sufficient given that the estimated required capacity of the current project is only ~25GB.

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

See above, the free storage space offered by the KU Leuven suffices for this project.

4. Data preservation after the end of the research project

Which data will be retained for at least five 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 pseudonymized data (i.e. choices, RTs and confidence reports for WP1-3; EEG and pupil recordings for WP3) will be stored and made accessible via an Open Access repository (e.g., Open Science Framework) after the publication of the results. The data will be preserved for ten years, after which they will be destroyed. Note that a copy of the data will remain available through an Open Access repository.

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

1. The data will be stored on the university's central servers (with automatic back-up procedures) for at least 10 years, conform the KU Leuven RDM policy.
2. In addition, data will be posted post-publication on an Open Access repository (e.g. Open Science Framework).

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

See above, the free storage space offered by the KU Leuven suffices for this project.

5. Data sharing and reuse

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

- Yes, in an Open Access repository

After publication of the results, the behavioral data of WP1-3 (choices, reaction times and confidence reports) and the EEG data of WP3 will be uploaded in a csv format to an open access repository (e.g. Open Science Framework) under a CC-BY license.

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

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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 in the comment section 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.

In an Open Access repository

When will the data be made available?

Upon publication of the research results

Which data usage licenses are you going to provide? If none, please explain why.

The full dataset will be uploaded in a cvs format on an Open Acccess Repository (e.g. Open Science Framework) as an open access dataset under a CC-BY license. Therefore, it will be available to anyone for any purpose, provided that they give appropriate credit to the creators.

Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, you have the option to provide it in the comment section.

- No

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

The Open Science Framework is free to use.

6. Responsibilities

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

The PI (Kobe Desender) together with the PhD student appointed to this project

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

The PI (Kobe Desender) together with the PhD student appointed to this project

Who will manage data preservation and sharing?

The PI (Kobe Desender) together with the PhD student appointed to this project

Who will update and implement this DMP?

The PI (Kobe Desender) bears the end responsibility of updating & implementing this DMP