FWO DMP Template - Flemish Standard Data Management Plan

Version KU Leuven

Project supervisors (from application round 2018 onwards) and fellows (from application round 2020 onwards) will, upon being awarded their project or fellowship, be invited to develop their answers to the data management related questions into a DMP. The FWO expects a **completed DMP no later than 6 months after the official start date** of the project or fellowship. The DMP should not be submitted to FWO but to the research co-ordination office of the host institute; FWO may request the DMP in a random check.

At the end of the project, the **final version of the DMP** has to be added to the final report of the project; this should be submitted to FWO by the supervisor-spokesperson through FWO's e-portal. This DMP may of course have been updated since its first version. The DMP is an element in the final evaluation of the project by the relevant expert panel. Both the DMP submitted within the first 6 months after the start date and the final DMP may use this template.

The DMP template used by the Research Foundation Flanders (FWO) corresponds with the Flemish Standard Data Management Plan. This Flemish Standard DMP was developed by the Flemish Research Data Network (FRDN) Task Force DMP which comprises representatives of all Flemish funders and research institutions. This is a standardized DMP template based on the previous FWO template that contains the core requirements for data management planning. To increase understanding and facilitate completion of the DMP, a standardized **glossary** of definitions and abbreviations is available via the following link.

1. General Project Information	
Name Grant Holder & ORCID	Febe Demeyer - 0000-0002-5736-0168
Contributor name(s) (+ ORCID) & roles	Eva Van den Bussche: supervisor - 0000-0003-1894-9380 Céline R. Gillebert: co-supervisor - 0000-0001-6686-7262 Hans Stuyck: co-supervisor - 0000-0001-7351-2064
Project number [1] & title	3H210632 - Insight and analytical problem solving in early aging
Funder(s) GrantID [2]	11PNU24N
Affiliation(s)	☐ **KU Leuven** ☐ Universiteit Antwerpen ☐ Universiteit Gent ☐ Universiteit Hasselt ☐ Vrije Universiteit Brussel ☐ Other: ROR identifier KU Leuven: 05f950310

[1] "Project number" refers to the institutional project number. This question is optional. Applicants can only provide one project number.

[2] Funder(s) GrantID refers to the number of the DMP at the funder(s), here one can specify multiple GrantIDs if multiple funding sources were used.

Please provide a short project description	We live in an aging society. One of the key challenges is to keep this growing population of older adults active and healthy. Several European countries are extending the retirement age. Consequently, the population at work will also age. However, when we age, our executive functions (EFs) decline. EFs are vital to planning, thinking abstractly and comprehending complex problems. The modern workplace often confronts workers with various, often parallel, streams of information that need to be processed. This heavily relies on EFs. How can we reconcile the reliance on EFs at the workplace with the increase of older workers with declining EFs? The current project aims to focus on a cognitive skill that might remain intact or even improve with aging. Insight problem solving is the sudden retrieval of the solution into consciousness after being stuck solving a problem. It is often assumed to be an implicit process that does not rely heavily on EFs. In contrast, analytical problem solving entails a conscious, effortful, step-by-step approach to obtain a solution. The aim of the current project is to study if and how older adults benefit from insight as opposed to analytical problem solving. To achieve this, we will compare phenomenological, behavioral and neural indices of insight and analytical problem solving between young adults and professionally active older adults. Furthermore, we will study how insight problem solving can be stimulated in professionally active older adults.

2. 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*	*ONLY FOR PHYSICAL DATA*
Dataset Name	Description	New or Reused	Digital or Physical	Digital Data Type	Digital Data Format	Digital Data Volume (MB, GB, TB)	Physical Volume
01-WP2: Experiment	Code for experiment (computer task)	☒ Generate new data	☒ Digital ☐ Physical	☒ Other: code	• .py • .psyexp	☒ < 1 GB	
01-WP2: Survey data	Survey data (demographic data) exported from Qualtrics from 78 young adults and 78 older adults	☒ Generate new data	☒ Digital ☐ Physical	☒ Numerical ☒ Textual	• .xlsx	☒ < 1 GB	
01-WP2: Experimental data	Experimental behavioral data from 78 young and 78 older adults	☒ Generate new data	☒ Digital ☐ Physical	☒ Numerical ☒ Textual	• .csv	☒ < 100 GB	
01-WP2: Raven data	Behavioral data from the Raven Standard Progressive Matrices test	☒ Generate new data	☐ Digital ☒ Physical	☒ Numerical			156 answers sheets
01-WP2: Qualitative data	Qualitative data: answers to two questions “Could you describe to me what it means to you to solve something with insight and to solve something analytically?”	☒ Generate new data	☒ Digital ☐ Physical	☒ Textual	• .xlsx	☒ < 1 GB	
01-WP2: Code	Code for data cleaning and analysis	☒ Generate new data	☒ Digital ☐ Physical	☒ Other: code	• .R • .spss	☒ < 100 GB	

01-WP2: Merged experimental data	Merged survey, experimental, Raven and qualitative data	☒ Generate new data	☒ Digital ☐ Physical	☒ Numerical ☒ Textual	• .csv • .R	☒ < 100 GB	
02- Aha! moments in daily life: Raw data	Survey data exported from Qualtrics from approximately 640 participants	☒ Generate new data	☒ Digital ☐ Physical	☒ Numerical ☒ Textual	• .xlsx	☒ < 1 GB	
02- Aha! moments in daily life: Code	Code for data cleaning and analysis	☒ Generate new data	☒ Digital ☐ Physical	☒ Other: Code	• .R	☒ < 1 GB	
02- Aha! moments in daily life: Processed data	Dataset after cleaning (i.e., removing unnecessary variables, removing incomplete surveys, etc)	☒ Generate new data	☒ Digital ☐ Physical	☒ Other: Code	• .R	☒ < 1 GB	
03-WP1 + WP3: Experiment	Code for experiment (computer task)	☒ Generate new data	☒ Digital ☐ Physical	☒ Other: code	• .py • .psyexp	☒ < 1 GB	
03- WP1: Behavioral data	Experimental behavioral data from 64 young and 64 older adults	☒ Generate new data	☒ Digital ☐ Physical	☒ Numerical ☒ Textual	• .csv	☒ < 100 GB	
03-WP1: Experience Sampling data	Experience sampling data from 64 young and 64 older adults	☒ Generate new data	☒ Digital ☐ Physical	☒ Numerical ☒ Textual	• .csv	☒ < 100 GB	
03-WP3: EEG data	EEG data from 64 young and 64 older adults	☒ Generate new data	☒ Digital ☐ Physical	☒ Numerical	• .bdf (specific BioSemi	☒ < 100 GB	

					EEG format)		
03-WP1+WP3: Raven data	Behavioral data from the Raven Standard Progressive Matrices test	☒ Generate new data	☐ Digital ☒ Physical	☒ Numerical			128 answers sheets
03-WP1+WP3: Survey data	Survey data (demographic data) exported from Qualtrics from 64 young adults and 64 older adults	☒ Generate new data	☒ Digital ☐ Physical	☒ Numerical ☒ Textual	• .xlsx	☒ < 1 GB	
03-WP1 + WP3: Code	Code for data cleaning and analysis	☒ Generate new data	☒ Digital ☐ Physical	☒ Other: code	• .R • .spss	☒ < 1 GB	
03-WP1+WP3: Merged experimental data	Merged survey, experimental, Raven, ESM and processed EEG data	☒ Generate new data	☒ Digital ☐ Physical	☒ Numerical ☒ Textual	• .csv • .R	☒ < 100 GB	
03-WP3: Preprocessed EEG data	Preprocessed EEG data from 164 participants (processed in EEGlab (Matlab))	☒ Generate new data	☒ Digital ☐ Physical	☒ Numerical	• .set • .ftd	☒ < 100 GB	
04-WP4: Online experiment	Code for online experiment in Pavlovia that contains demographic questions, behavioral experiment and Raven	☒ Generate new data	☒ Digital ☐ Physical	☒ Other: Code	• .psyexp	☒ < 1 GB	
04-WP4: Raw data	Raw data that contains demographic data, behavioral data and data from the Raven	☒ Generate new data	☒ Digital ☐ Physical	☒ Numerical ☒ Textual	• .csv	☒ < 100 GB	
04-WP4: Code	Code for data cleaning and analysis	☒ Generate new data	☒ Digital ☐ Physical	☒ Other: Code	• .R • .SPSS	☒ < 1 GB	

04-WP4: Processed data	Processed data that contains demographic data, behavioral data and data from the Raven	☒ Generate new data	☒ Digital ☐ Physical	☒ Numerical ☒ Textual	• .csv • .R	☒ < 100 GB	

GUIDANCE:
The data description forms the basis of your entire DMP, so make sure it is detailed and complete. It includes digital and physical data and encompasses the whole spectrum ranging from raw data to processed and analysed data including analysis scripts and code. Physical data are all materials that need proper management because they are valuable, difficult to replace and/or ethical issues are associated. Materials that are not considered data in an RDM context include your own manuscripts, theses and presentations; documentation is an integral part of your datasets and should described under documentation/metadata.
RDM Guidance on data

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.	No.
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: - 01- WP2: G-2022-5918-R3(AMD) - 02: Aha! moments in daily life: G-2023-7070 ☐ Yes, animal data; provide ECD reference number: ☐ Yes, dual use; provide approval number: ☐ No Additional information: We will ask the Social and Societal Ethics Committee for ethical approval before initiating the project's work packages that are not listed above (see SMEC approval numbers above for two work packages). As such, all work packages will fulfill the legal obligations regarding personal data.

Will you process personal data[3]? 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) ☐ No Additional information: Most datasets will contain personal data: - Name - Email address - Birth date - Ethnicity - Gender and biological sex - Education - Occupation and professional activities - Personal data concerning health (i.e., presence of neurological and psychiatric disorders, cancer treatments, medication intake, presence of bad/impaired vision, alcohol/drug abuse) Datasets that will contain personal data: - 01-WP2: Survey data - 01-WP2: Merged experimental data - 02- Aha! moments in daily life: Raw data - 02- Aha! moments in daily life: Processed data - 03-WP1+WP3: Survey data - 03-WP1+WP3: Merged experimental data - 04-WP4: Raw data - 04-WP4: Processed data PRET approval number: - 01-WP2: G-2022-5918-R3(AMD) - 02-Aha! moments in daily life: G-2023-7070 We will submit PRET applications for the remaining work packages (WP1+WP3+WP4). Every participant will be assigned a participant number, which will be linked to all their data. Using the participant number, we will pseudonymize all data because only the main researchers will be able to link the behavioral data to participants' personal information (e.g., name or email address) for the purpose of the study.

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.	☐ Yes ☒ No If yes, please comment:
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 to what data they relate and what restrictions are in place.	☐ Yes ☒ No If yes, please explain:
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 to what data they relate and which restrictions will be asserted.	☐ Yes ☒ No

[3] See Glossary Flemish Standard Data Management Plan

3. 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). *RDM guidance on documentation and metadata.*	First, each dataset will be accompanied by a **codebook** in an Excel-document to make the data understandable and usable. In these codebooks, I will explain what each variable means. Namely, I will provide specific information about the experimental data, questionnaires, ESM data, etc, such as the variable labels, their description, units of measurement, and ranges. Each dataset will also be accompanied by a **ReadMe text file,** which will contain information about the content of the data: who collected the data, when the data were collected, how the data were created (e.g., computer program writes a raw csv file to the local computer after the experiment), to which research project the dataset belongs, how the dataset should be opened, what delimiter is used to separate the data, and the rights on the dataset. Second, each computer programming task will also be accompanied by a **ReadMe text file** with details about the number of trials, different conditions, a task description, etc. Third, **code explanation in file** will also be added to all computer task scripts and coding scripts that contain code to clean and analyze the data. In other words, explanatory comments are added to the code for clarification so that third parties and I can understand the code. Finally, **study manuals** for each research project will be created that contain the study protocol and that will help collect the data in a standardized way. For each work package or research project, a new folder will be created on the OneDrive for Business of the researcher where all the data belonging to that specific project is stored. The **folder structure** on the OneDrive for Business of the researcher will be documented in a ReadMe text file. Within each main folder, a number of subfolders will be created that refer to a specific step in the research process (e.g., Ethical Approval, Programming, Preregistration, Data Collection, Data, Analyses, Results, and Manuscript). Furthermore, I use GitLab as a **versioning system** for working on my code to clean the data and analyze it and Open Science Framework (OSF) as a tool for **data documentation**.

Will a metadata standard be used to make it easier to **find 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. *REPOSITORIES COULD ASK TO DELIVER METADATA IN A CERTAIN FORMAT, WITH SPECIFIED ONTOLOGIES AND VOCABULARIES, I.E. STANDARD LISTS WITH UNIQUE IDENTIFIERS.*	☐ Yes ☒ No If yes, please specify (where appropriate per dataset or data type) which metadata standard will be used: If no, please specify (where appropriate per dataset or data type) which metadata will be created: There is no formally recognized metadata standard specific to psychology. The metadata of the entire PhD project will consist of codebooks, ReadMe text files and code explanations in file. Anonymized datasets will be added to the OSF. The anonymized data on OSF will contain unique identifiers (DOI) and relevant keywords to make the data easy to find.

4. Data Storage & Back-up during the Research Project	
Where will the data be stored? *Consult the interactive KU Leuven storage guide to find the most suitable storage solution for your data.*	☐ Shared network drive (J-drive) ☐ Personal network drive (I-drive) ☒ OneDrive (KU Leuven) ☐ Sharepoint online ☐ Sharepoint on-premis ☐ Large Volume Storage ☐ Digital Vault ☒ Other: Paper data (e.g., questionnaires) will be stored in a locked cabinet in the supervisor's office.
How will the data be backed up? *WHAT STORAGE AND BACKUP PROCEDURES WILL BE IN PLACE TO PREVENT DATA LOSS?*	☒ Standard back-up provided by KU Leuven ICTS for my storage solution ☐ Personal back-ups I make (specify) ☐ Other (specify)

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 ☐ No If no, please specify:
How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons? *CLEARLY DESCRIBE THE MEASURES (IN TERMS OF PHYSICAL SECURITY, NETWORK SECURITY, AND SECURITY OF COMPUTER SYSTEMS AND FILES) THAT WILL BE TAKEN TO ENSURE THAT STORED AND TRANSFERRED DATA ARE SAFE.* *Guidance on security for research data*	Since we will be working with personal data, all the data will be stored on KU Leuven OneDrive for Business based on the recommendations made by KU Leuven. KU Leuven provides an additional backup on top of the measures that Microsoft provides as standard to protect the data. OneDrive for Business is suitable for strictly confidential data, as long as multifactor authentication with the KU Leuven Authenticator app is activated. Therefore, KU Leuven OneDrive for Business is suitable for storing personal data. Data files will also be transferred to the supervisor using the Belnet filesender. Paper data (e.g., questionnaires) will be stored in a locked cabinet in the supervisor's office.
What are the expected costs for data storage and backup during the research project? How will these costs be covered?	Usage of the KU Leuven OneDrive for Business is free. Therefore, there are no expected costs.

5. 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...). *Guidance on data preservation*	☒ All data will be preserved for 10 years according to KU Leuven RDM policy ☐ All data will be preserved for 25 years according to CTC recommendations for clinical trials with medicinal products for human use and for clinical experiments on humans ☐ Certain data cannot be kept for 10 years (explain)
Where will these data be archived (stored and curated for the long-term)? *Dedicated data repositories are often the best place to preserve your data. Data not suitable for preservation in a repository can be stored using a KU Leuven storage solution, consult the interactive KU Leuven storage guide.*	☒ KU Leuven RDR ☐ Large Volume Storage (longterm for large volumes) ☐ Shared network drive (J-drive) ☒ Other (specifiy): To archive data securely at the end of the project, all digital data will be stored on the KU Leuven OneDrive for Business of the supervisor (with automatic back-up procedures) for at least 10 years after the end of the project, conform the KU Leuven RDM policy. Paper data will be stored in a closed locket of the supervisor, organized in a folder per study. In order to make the data publicly available through OSF, the pseudonymized data will later be anonymized by removing the participant number that links the personal data (i.e., names and email addresses) to the data and by adding a new, random participant number. In this way, names and email addresses can never be linked to the data obtained in the study when consulting the openly available data. The anonymized data will be made publicly available through OSF. After the project is finished, the DOI identifier will be registered. In this way, the data can also be retrieved from KU Leuven RDR.
What are the expected costs for data preservation during the expected retention period? How will these costs be covered?	Data preservation on the KU Leuven OneDrive for Business, OSF and KU Leuven RDR is free of charge. Storage capacity on the OneDrive for Business can be extended to 5 TB without costs. We do not expect to exceed 5 TB. In case we exceed this limit, possible expenses will be covered by the research group.

6. 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. *NOTE THAT 'AVAILABLE' DOES NOT NECESSARILY MEAN THAT THE DATA SET BECOMES OPENLY AVAILABLE, CONDITIONS FOR ACCESS AND USE MAY APPLY. AVAILABILITY IN THIS QUESTION THUS ENTAILS BOTH OPEN & RESTRICTED ACCESS. FOR MORE INFORMATION: HTTPS://WIKI.SURFNET.NL/DISPLAY/STANDARDS/INFO-EU-REPO/#INFOEUREPO-ACCESSRIGHTS*	☒ Yes, as open data ☐ Yes, as embargoed data (temporary restriction) ☐ Yes, as restricted data (upon approval, or institutional access only) ☐ No (closed access) ☐ Other, please specify: All merged datasets (i.e., datasets containing all research data from the entire study) will be anonymized and made publicly available on OSF, along with the associated codebooks and ReadMe text files. All computer tasks and code used to clean and analyze the data will also be made available on OSF.
If access is restricted, please specify who will be able to access the data and under what conditions.	The data is intended to be open data.
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.	☒ Yes, privacy aspects ☐ Yes, intellectual property rights ☐ Yes, ethical aspects ☐ Yes, aspects of dual use ☐ Yes, other ☐ No If yes, please specify: Since I will be working with personal data, legal restrictions (e.g., GDPR) are in place. Only anonymized data will be shared.

Where will the data be made available? If already known, please provide a repository per dataset or data type.	☒ KU Leuven RDR ☒ Other data repository (specify): Open Science Framework ☐ Other (specify)
When will the data be made available?	☒ Upon publication of research results ☐ Specific date (specify) ☐ Other (specify)
Which data usage licenses are you going to provide? If none, please explain why. *A DATA USAGE LICENSE INDICATES WHETHER THE DATA CAN BE REUSED OR NOT AND UNDER WHAT CONDITIONS. IF NO LICENCE IS GRANTED, THE DATA ARE IN A GREY ZONE AND CANNOT BE LEGALLY REUSED. DO NOTE THAT YOU MAY ONLY RELEASE DATA UNDER A LICENCE CHOSEN BY YOURSELF IF IT DOES NOT ALREADY FALL UNDER ANOTHER LICENCE THAT MIGHT PROHIBIT THAT.* *Check the RDR guidance on licences for data and software sources code or consult the License selector tool to help you choose.*	☒ CC-BY 4.0 (data) ☐ Data Transfer Agreement (restricted data) ☐ MIT licence (code) ☐ GNU GPL-3.0 (code) ☐ Other (specify)
Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, please provide it here. *INDICATE WHETHER YOU INTEND TO ADD A PERSISTENT AND UNIQUE IDENTIFIER IN ORDER TO IDENTIFY AND RETRIEVE THE DATA.*	☒ Yes, a ~~PID~~ DOI will be added upon deposit in a data repository ☐ My dataset already has a PID ☐ No
What are the expected costs for data sharing? How will these costs be covered?	There are no expected costs for sharing the data at OSF and KU Leuven RDR as this is free of charge.

7. Responsibilities	
Who will manage data documentation and metadata during the research project?	The researcher: Febe Demeyer.
Who will manage data storage and backup during the research project?	The researcher: Febe Demeyer. The supervisor (Eva Van den Bussche) is responsible for ensuring that researcher implements research data management.
Who will manage data preservation and sharing?	The researcher: Febe Demeyer is responsible for data preservation and sharing during the project. After the project ends, preservation and reuse of the data is the responsibility of the supervisor (Eva Van den Bussche).
Who will update and implement this DMP?	The supervisor, Eva Van den Bussche, is responsible for ensuring that the researcher (Febe Demeyer) updates and implements this DMP.