Investigating the mechanisms behind multisensory hypersensitivity in human experimental models of pain hyperalgesia

A Data Management Plan created using DMPonline.be

Creators: Lieve Filbrich, n.n. n.n.

Affiliation: KU Leuven (KUL)

Funder: Fonds voor Wetenschappelijk Onderzoek - Research Foundation Flanders (FWO)

Template: FWO DMP (Flemish Standard DMP)

Principal Investigator: n.n. n.n.

Grant number / URL: G001923N

ID: 200242

Start date: 01-01-2023

End date: 31-12-2026

Project abstract:

Chronic pain patients show hypersensitivity to non-nociceptive sensory stimuli such as visual stimuli, odors and other somatic symptoms. This phenomenon has been labelled Multisensory Hypersensitivity (MHS). By using experimental models of neuropathic pain in human volunteers we observed that hypersensitivity to mechanical stimuli, a key feature of sensitized nociceptive pathways, was accompanied by increased responsiveness to non-nociceptive stimuli, approximating what has been shown in chronic pain. However, an understanding of the underlying mechanisms of, as we labelled them, “corollary effects” of nociceptive sensitization, is still missing. In this project we will investigate two novel hypotheses: that MSH can develop as a result of attentional biases or increased arousal (the attention and arousal hypotheses). In the attentional model, intense pain will induce nociceptive hypersensitivity but also trigger a perceptual bias towards the stimulated arm. In the arousal model pain will not trigger any significant attentional bias, but would rather increase arousal, which would contribute to multisensory hypersensitivity. We also hypothesize a role of fear of intense pain as moderator in both models. These models will be tested in a series of experiments involving the use of experimental models of pain hypersensitivity in combination with EEG and pupil recording, skin conductance, and psychophysical testing.

Last modified: 15-06-2023

Investigating the mechanisms behind multisensory hypersensitivity in human experimental models of pain hyperalgesia
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	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
		Please choose from the following options: • Generate new data • Reuse existing data	*Please choose from the following options:* • Digital • Physical	*Please choose from the following options:* • Observational • Experimental • Compiled/aggregated data • Simulation data • Software • Other • NA	*Please choose from the following options:* • .por, .xml, .tab, .cvs,.pdf, .txt, .rtf, .dwg, .gml, ... • NA	*Please choose from the following options:* • <100MB • <1GB • <100GB • <1TB • <5TB • <10TB • <50TB • >50TB • NA	
EEG data	psychophysiological measure: electroencephalographic recordings (XP1,2,5)	new data	digital	experimental	.eeg .vhdr .vmrk .mat	<1TB	
Pupil	psychophysiological measure: pupil size recordings (XP3)	new data	digital	experimental	.mat	<10GB	
Skin conductance	psychophysiological measure: electrodermal activity recordings (XP5)	new data	digital	experimental	.mat	<10GB	
TOJ	Psychophysics: Temporal order judgments (XP4)	new data	digital	experimental	.mat	<10GB	
RT	reaction time measurements (XP1,2,3,5)	new data	digital	experimental	.mat	<1GB	
pinprick ratings	Intensity ratings to mechanical stimulation of the skin (0-100) (XP1-5)	new data	digital	experimental	.cvs	<100MB	
fear ratings	Rating on the fear of stimulation on a visual analog scale (0-100) (XP1-5)	new data	digital	observational	.cvs	<100MB	

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)? Describe these issues in the comment section. Please refer to specific datasets or data types when appropriate.

- Yes, human subject data

An application for ethical approval will be introduced at the Social and Societal Ethics Committee (SMEC) of KULeuven as soon as possible

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

Personal data such as the name, surname, phone number, date of birth, email address, bank information will be used at recruitement stage and/or for the renumeration of the participants. This data will be locked separately from the experimental data (acess only by PI).
Experimental data will be pseudonymised: demographic variables (age, sex) and subjective experiences (e.g. rating scales, psychophysiological responses; cf. research data summary). These data won't be linked to the identity of the participants.
PRET: Ethical application in preparation

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 experiments we will provide

- README.txt files
- experimental protocols
- annotated experimental scripts (Matlab)
- At the data level: data dictionaries

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.

- No

Nothing additional to previous question

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

Where will the data be stored?

Data will be stored on the personal KULeuven OneDrive in folders that will only be accessible to the researchers involved in the project (PI, Post-doc, PhD student).
Data will additionally be stored on the sharepoint site (KULeuven) of the research group (Health Psychology)

How will the data be backed up?

- A back-up is provided via automatic version management of the files in OneDrive, maintaining up to 100 versions per file.
- Sharepoint Kuleuven (Health Psychology group)

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

All KU Leuven personnel has access to 2 TB of data storage on OneDrive. As the estimated sizes of the datasets <2TB, sufficient storage and backup capacity is available.

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

- Due to the personal nature of OneDrive, files that you do not explicitly share are not accessible to anyone else. As such, a separate folder will be created and encrypted for these datasets. Only the PI and registered collaborating researchers (post-doc, PhD student) will have access to this folder via the encryption key.
- On the Sharepoint of the group, datasets will be stored in a folder only accessible by PI and registered collaborating researchers

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

- OneDrive for Business is free for staff and students of KU Leuven.
- Sharepoint is free for staff and students of KU Leuven.

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 digitally generated data will be archived for 10 years after study completion, in line with the KU Leuven RDM policy.

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

- on the group Sharepoint
- additional secondary backup on encrypted external backup of the Health Psychology group
- On a data repository

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

Since the datasets are expected to be relatively small, this should be free of charge

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 a restricted access repository (after approval, institutional access only, ...)

Data will be made available in an open access repository:
Digital data (de-identified)linked to publication: free access of data
Complete digital datasets (de-identified): restricted access, i.e. available upon request

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

Researchers will have to motivate why they want access to the data (complete datasets):
What topic are you studying?
How is the data linked to your research domain?
Why do you think you need this data?
Which question/problem will the data help with?
What do you expect the data to provide you with?

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

Digital datasets will be anonymized

Where will the data be made available? If already known, please provide a repository per dataset or data type.

OSF (Open Science Framework), which we already used for our past projects or KULeuven research data repository

When will the data be made available?

Upon publication of research results

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

Data will be made available under a creative commons attribution license (cc-by 4.0), so that users have to give credit to the original data 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.

- Yes

A DOI will we available

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

OSF and KULeuven research data repository are free of charge, no costs are expected for data sharing

6. Responsibilities

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

The post-doc (Lieve Filbrich) and PhD student (to be hired), under the supervision of the PI (Diana Torta)

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

The post-doc (Lieve Filbrich) and PhD student (to be hired), under the supervision of the PI (Diana Torta)

Who will manage data preservation and sharing?

The PI (Diana Torta)

Who will update and implement this DMP?

The post-doc (Lieve Filbrich) and PhD student (to be hired), under the supervision of the PI (Diana Torta).