OPEN SCIENCE IS MORE THAN OPEN DATA

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Ass. Professor
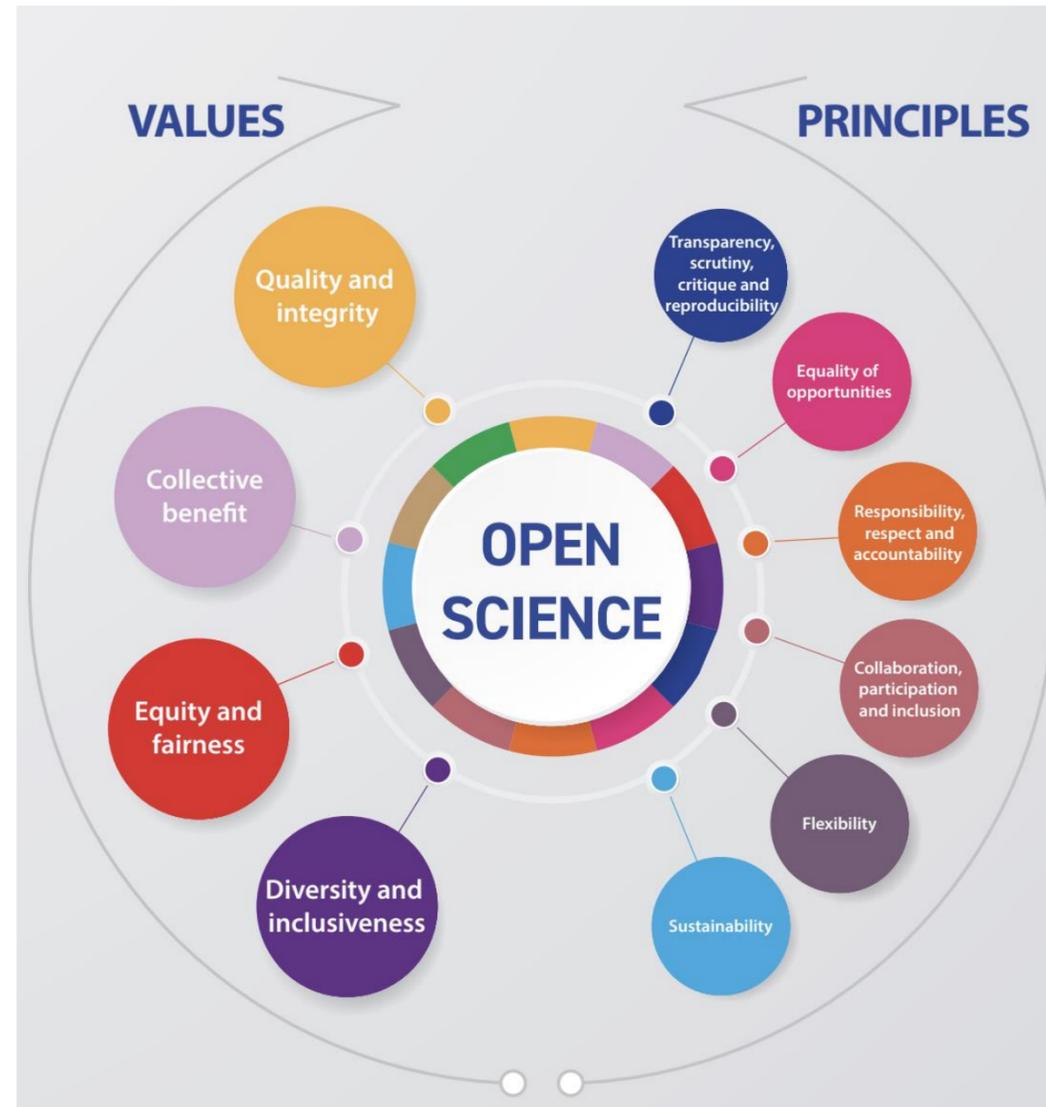UNIGE-FPSE, Neurobiology of Concepts Expressions (NoCE) Lab

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WHAT are we opening?

WHY are we opening?

HOW are we opening?

Share hypothesis & plans, then analysis code

Share preprocessed, not raw data

Submit to a journal, but post pre-print

There is no secret recipe & It is not an innate talent.

There is no sect of experts: wide community,

made prolific and productive by its heterogeneity;

to learn from, to contribute to.

From each according to their ability, to each according to their needs.

MAY 9 2025

LEVERAGING OPEN DATA: CHALLENGES IN THE AGE OF REPRODUCIBLE SCIENCE

Alessandra Rampinini, PhD
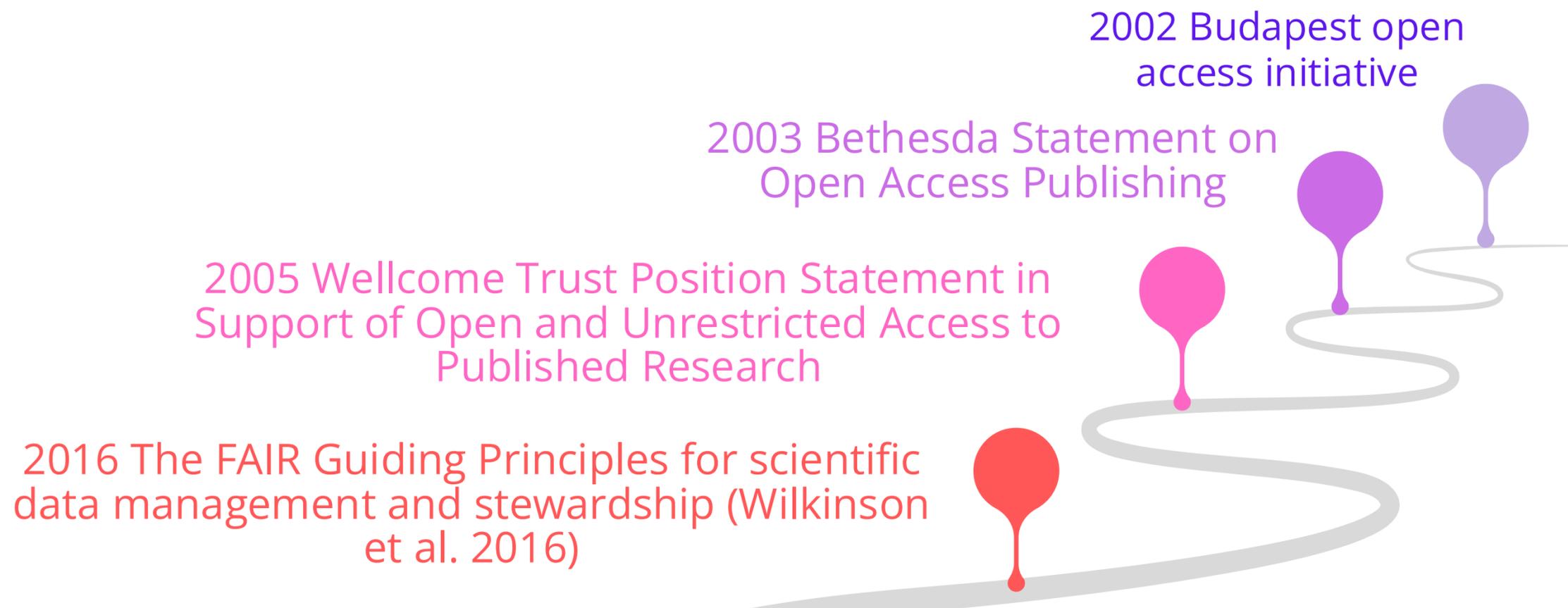Maître Assistante
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WHY THIS TOPIC?

Starting the 2000s we have seen a growing number of calls for open access to science:

2002 Budapest open access initiative

2003 Bethesda Statement on Open Access Publishing

2005 Wellcome Trust Position Statement in Support of Open and Unrestricted Access to Published Research

2016 The FAIR Guiding Principles for scientific data management and stewardship (Wilkinson et al. 2016)
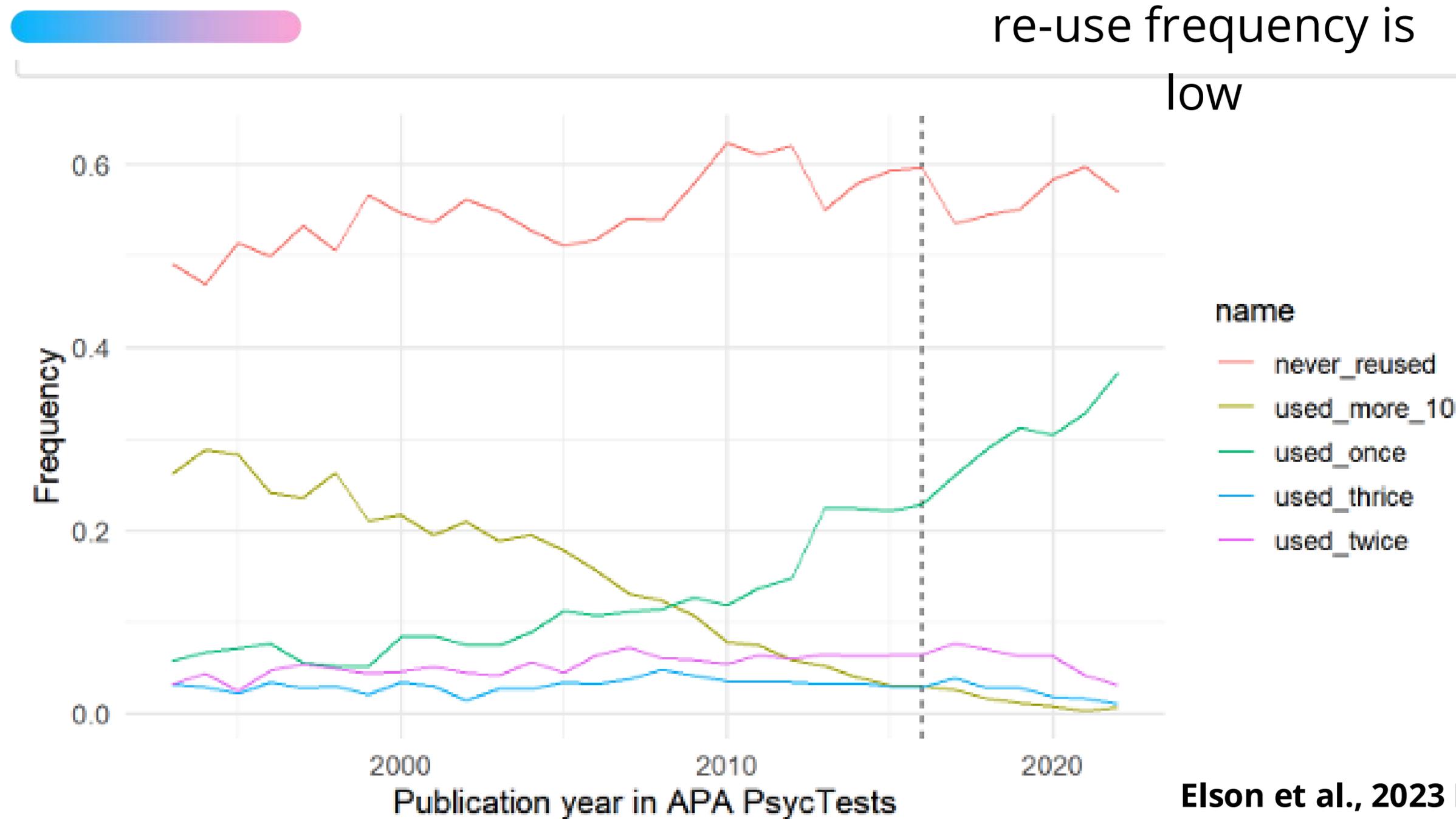
GENERAL CHALLENGES

1) Curbing the reproducibility crisis

2) Complying to journal and funding body requirements

3) Overcoming our own fears of misuse (e.g. Ai training)

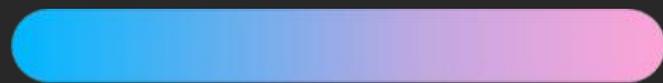# S.O.B.E.R GUIDELINES: PSYCHOLOGICAL MEASURES AREN'T TOOTHBRUSHES

- Anyone can use them ;)
  [Elson et al., 2023 Nat. Comm. Psych](#)

- The literature does not converge on standards over time, but rather is becoming increasingly fragmented.

- The Standardisation Of BEhavior Research (SOBER) guidelines aim to ensure that psychological measures are standardised and, unlike toothbrushes, reused by others

S.O.B.E.R GUIDELINES: PSYCHOLOGICAL MEASURES AREN'T TOOTHBRUSHES

re-use frequency is low

Elson et al., 2023 Nat. Comm. Psych

THREATS TO OPEN SCIENCE

Management & long-term maintenance: personnel, infrastructure

Dangers linked to climate change

Dangers linked to geopolitics
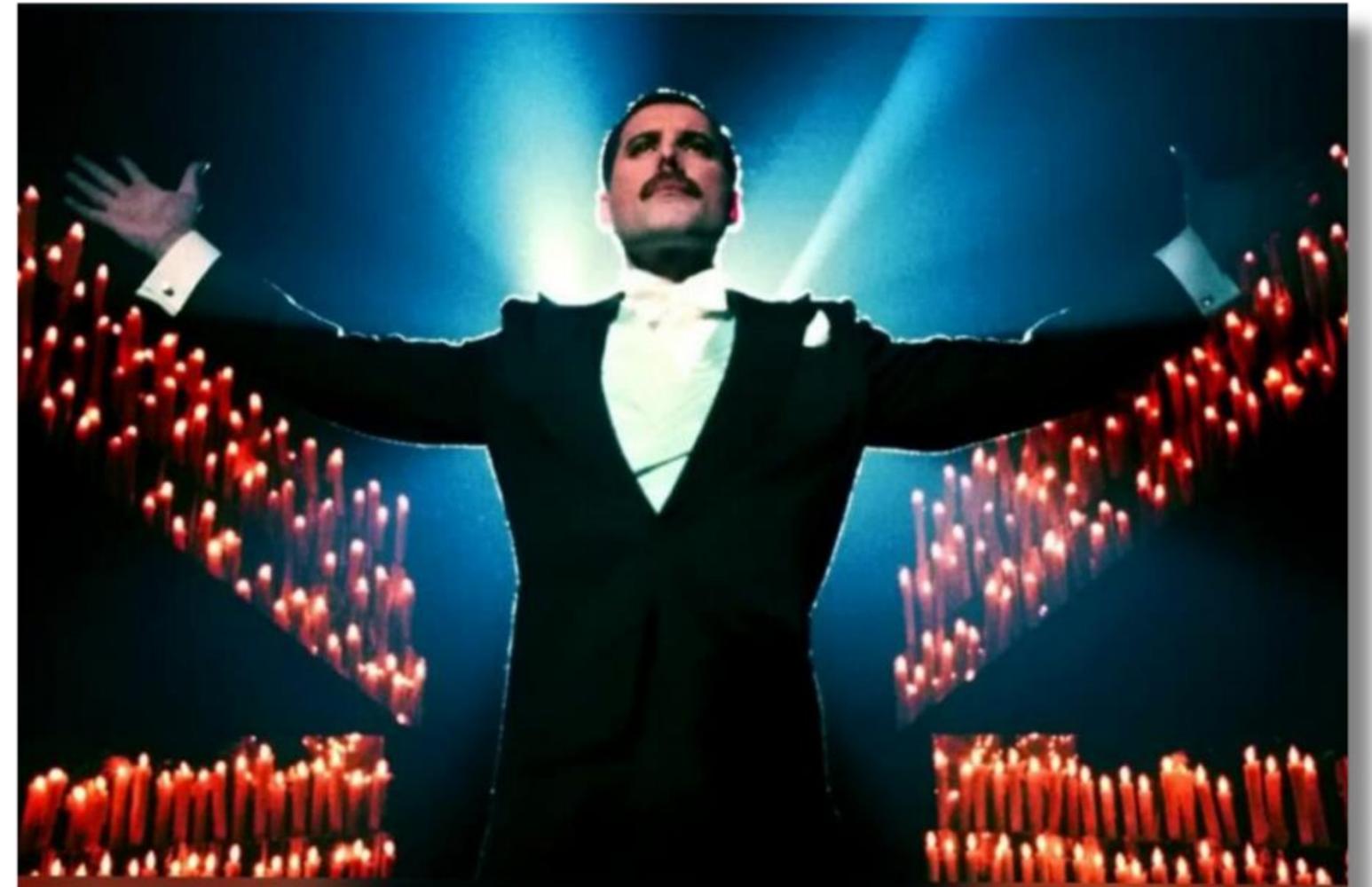
MANAGEMENT & LONG-TERM MAINTENANCE

who wants to live forever?

Shall **datasets** live forever?
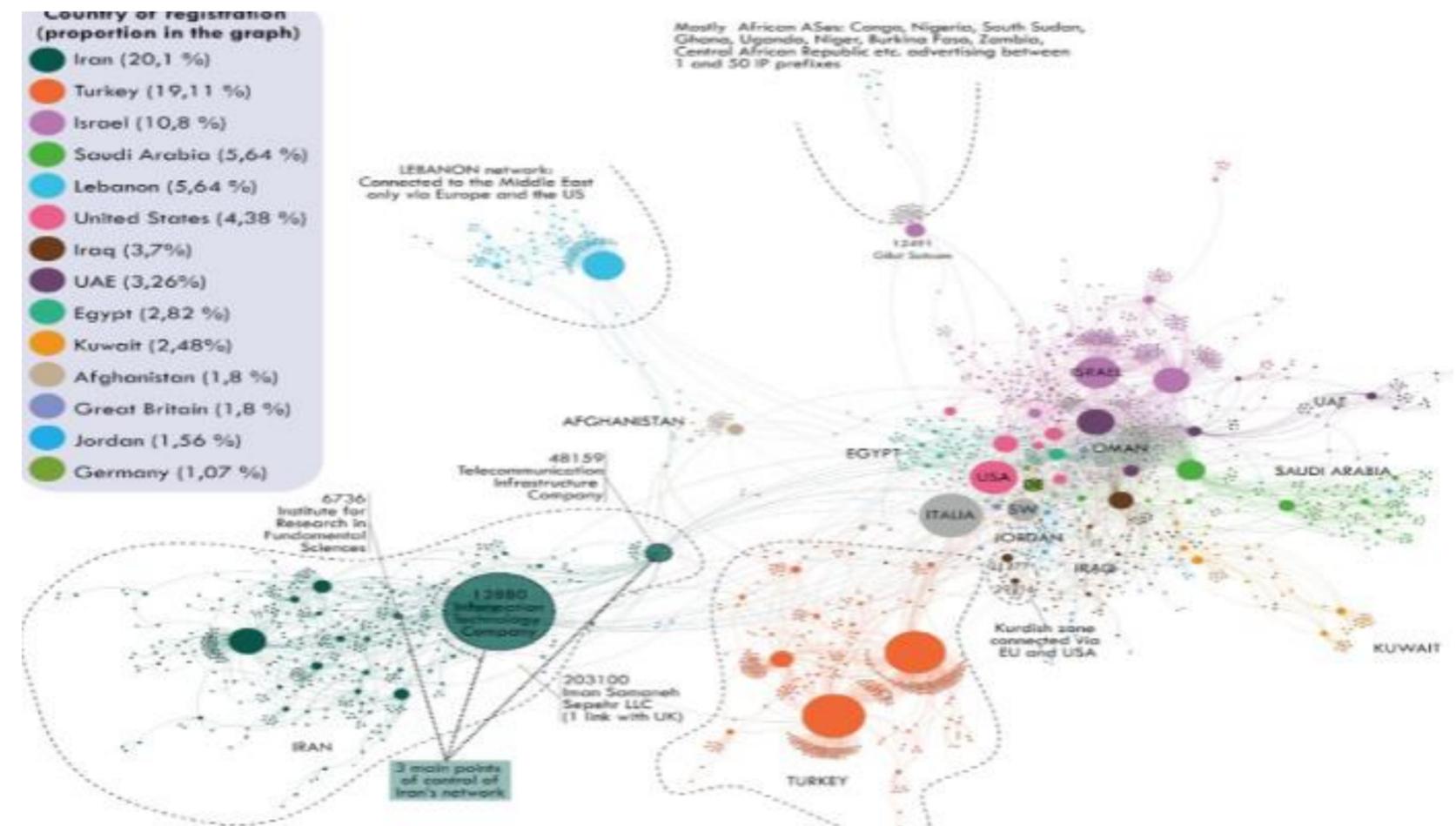**Relevance issue**
Space issue
Personnel issue

THE CYBERSPACE IS CONTENDED LAND

The cyberspace has become a strategic domain

In 2016, at the Warsaw Summit, NATO member nations recognized cyberspace as a new operational domain in which NATO "must defend itself as effectively as it does in the air, on land at sea"
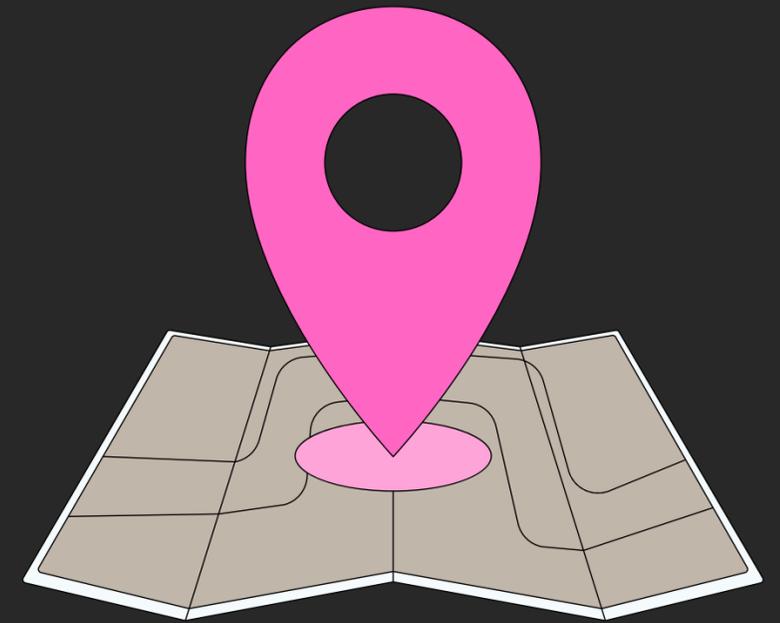
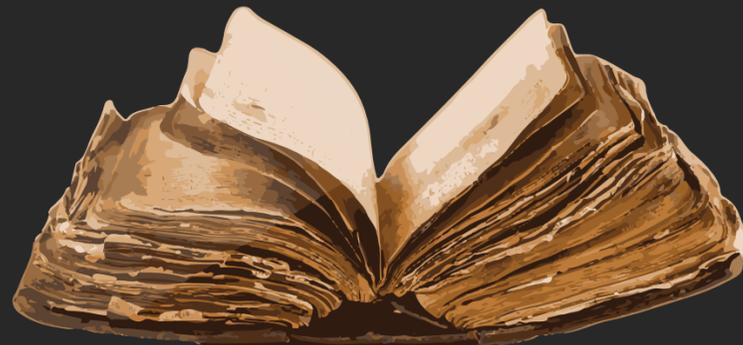**States can leverage the Border Gateway Protocol (BGP) as a tool of geopolitical control**
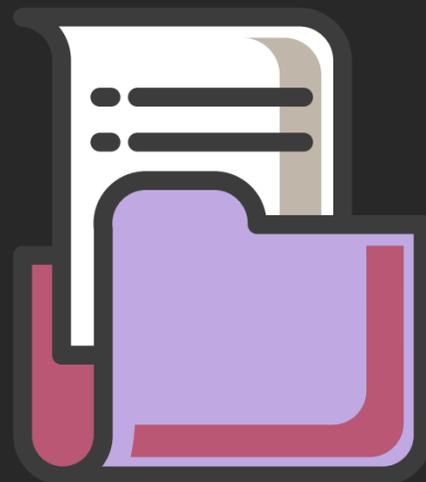

Salamatian et al., 2021

DATA-SPECIFIC CHALLENGES

CHALLENGE 1

Data location and format

- subject to institutional and national policies

- can become obsolete

- multiple are available (general or subject-specific)

CHALLENGE 2

Lack of standardisation of behavioural data

PsychoPy

Psychtoolbox

presentation

E-Prime 3
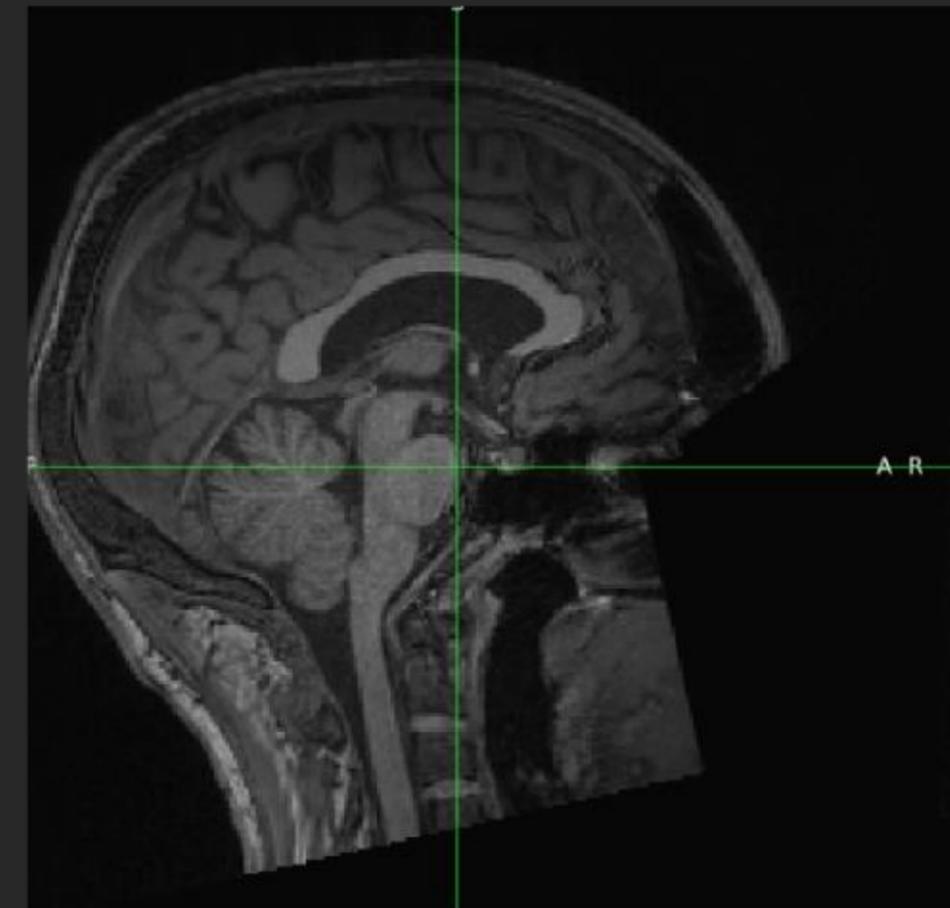
TASK DELIVERY
LOG FILE STRUCTURE
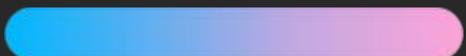
CHALLENGE 3

Navigating ethical concerns

- how to best anonymise data?
  - data-specific and population-specific decision
  - DUAs might be needed when sensitive info must be kept
  - platforms vs. DUAs (e.g. OpenNeuro)
- making sure sensitive data is coded
  - preserving access to code correspondences
  - keeping ethical protocols up-to-date
- open science waivers in informed consent forms
  - participants need to understand that we are sharing data

Participants need to be protected *always* (in the EU...)

NEBULA101

My lab's contribution to open science, mindful of all the challenges...
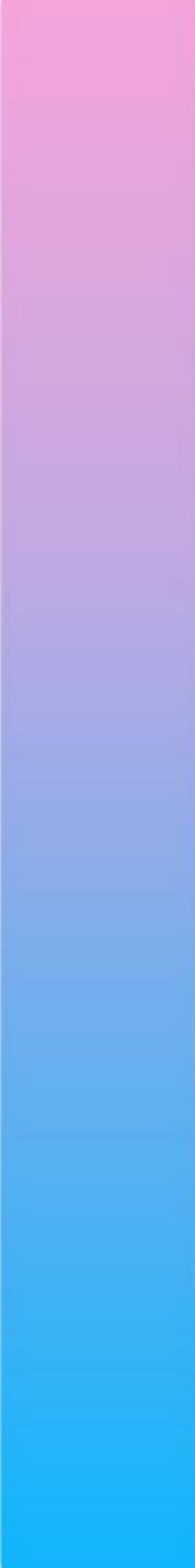
Key Features:

- Multimodal dataset integrating phenotypical and endophenotypical data.
- Sample: 101 individuals with rich multilingual and cognitive profiles.
- Imaging: sMRI, DWI, resting-state and task-based fMRI.
- Behavioural: 36 Measures of language, working memory, attention, musicality and mathematics.

WHAT CAN YOU DO WITH IT?

- Advancing methods for integrating multimodal data
- Technical developments (e.g. imaging analysis)
- Benchmarking linguistic theories using the aptitude and cognitive metrics
- **...re-use it!**

NEBULA 101

NEURO-BEHAVIOURAL UNDERSTANDING

OF LANGUAGE APTITUDE

THANK YOU

If you're hiring or keen to team up, let's talk!

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