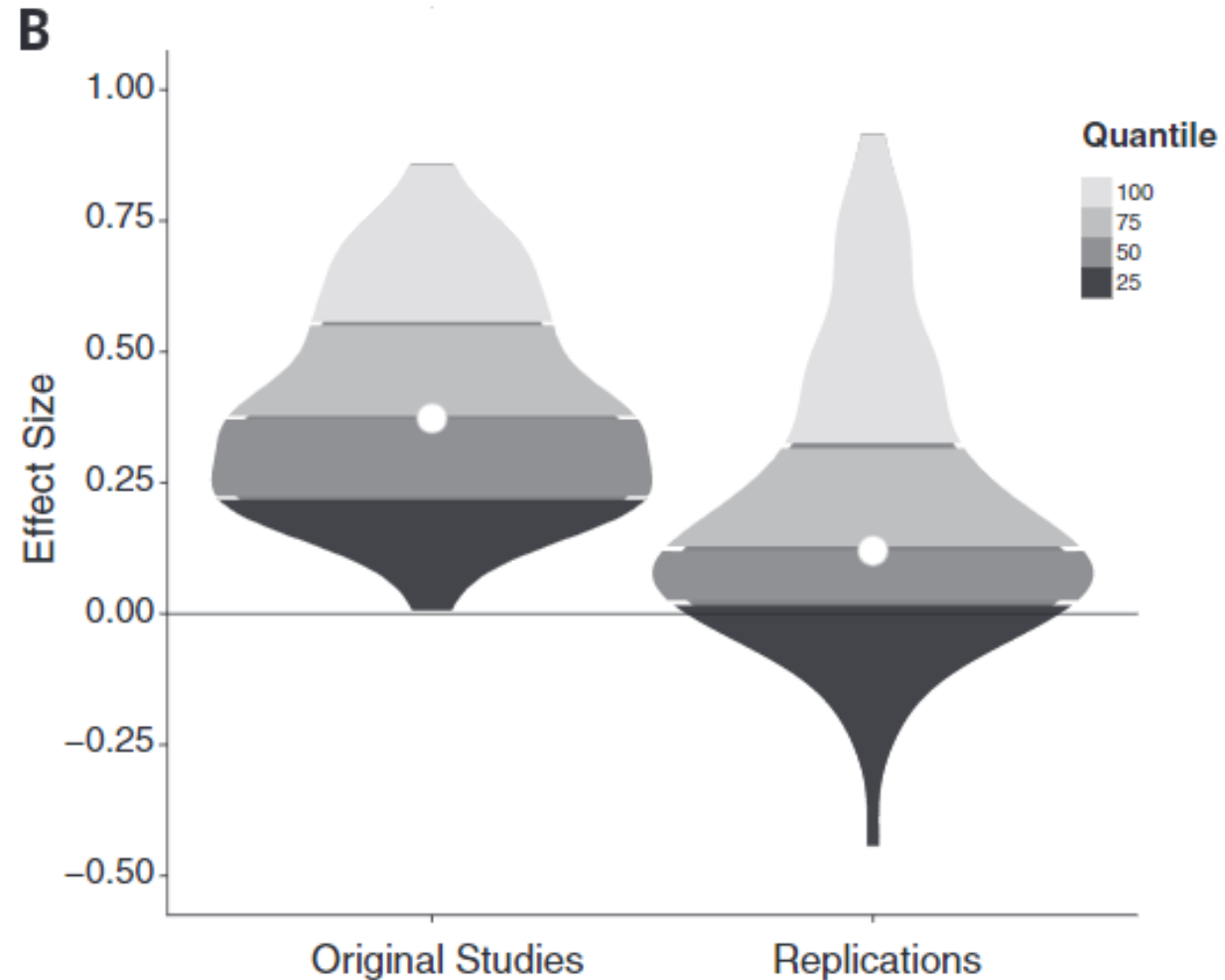
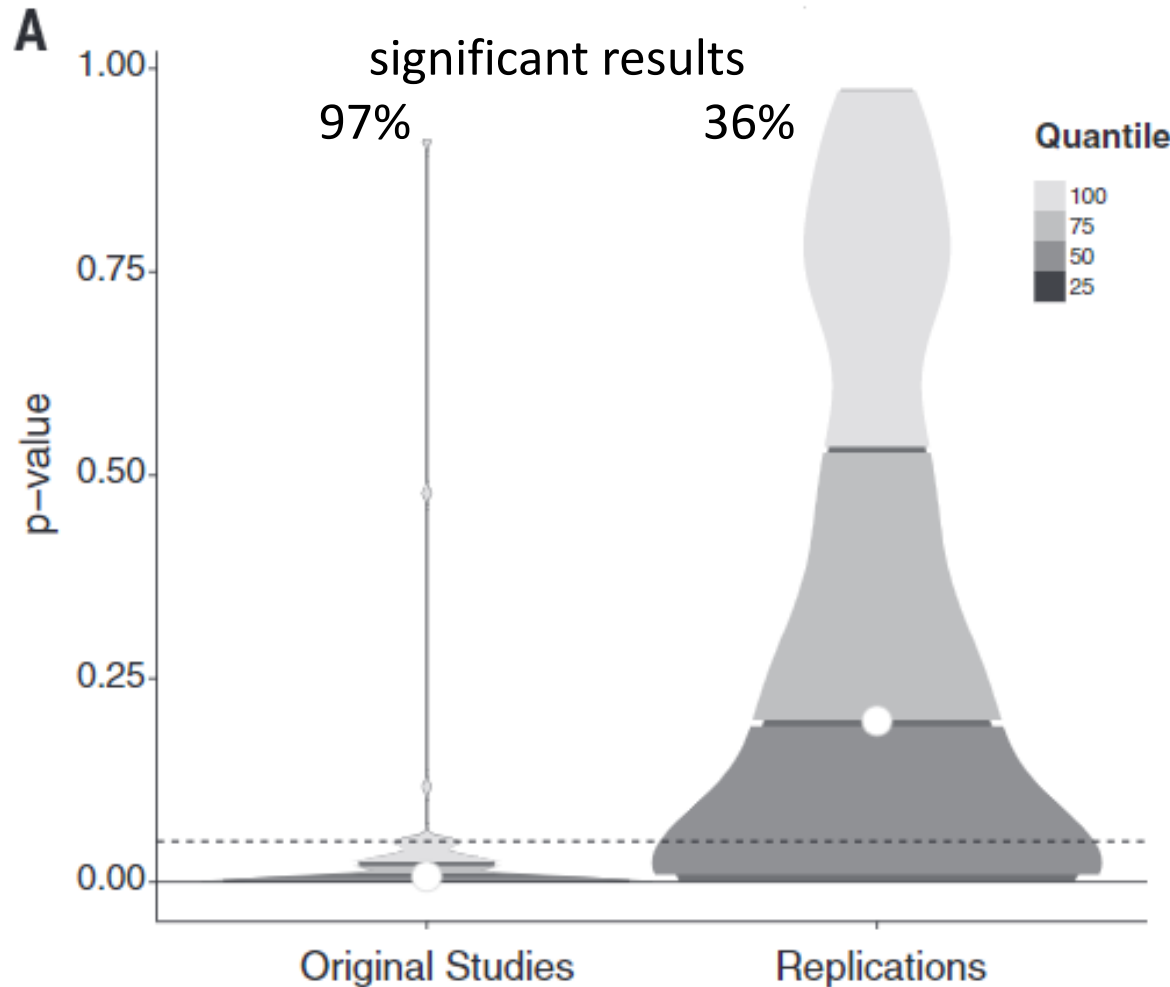


The Reproducibility Crisis

Replication of 100 studies in psychological science



The Reproducibility Crisis - Where does it come from?

Results matter the most (and more than methodological rigor)

Publication bias

Scientific career

- Lack of rigor in methodological and scientific practices
 - Insufficient statistical power
 - Undisclosed analytic flexibility
- Questionable research practices
 - P-hacking
 - P-harking
- Lack of data transparency

Registered Reports

Peer review before results are known



**Stage 1
Peer Review** ↑

**Stage 2
Peer Review** ↑

Rational
Study design/variables
Positive controls
Sample size

In Principle
Acceptance

Methods unchanged
Conclusions justified

Registered Reports (Our experience)

Peer review before results are known



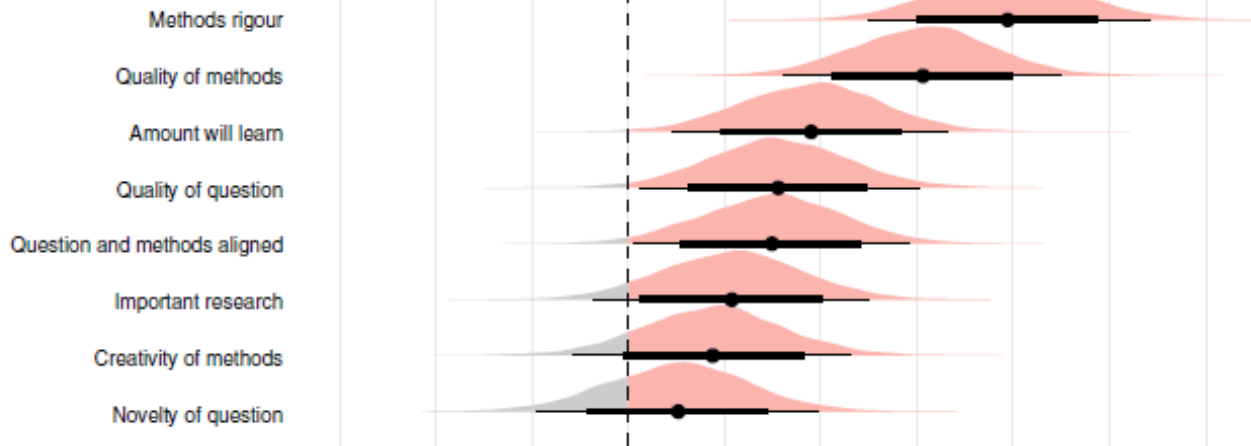
Understand your Hps (statistically)
Understand your variables
Quality checks/positive controls
Set methods before seeing data
Statistical power

In Principle
Acceptance

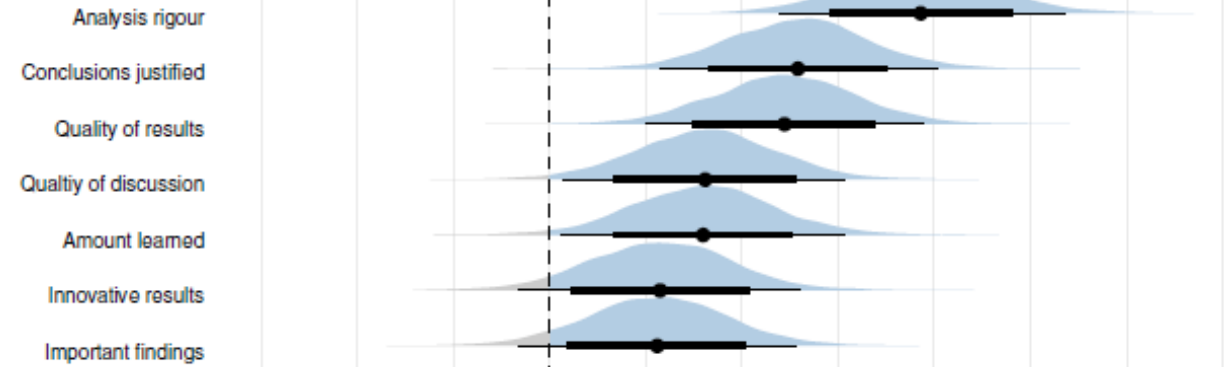
Higher confidence on results (you & others)
Publish any result
Exploratory analyses
Transparency = Information
Contribution to science advancement

Do RRs improve research quality?

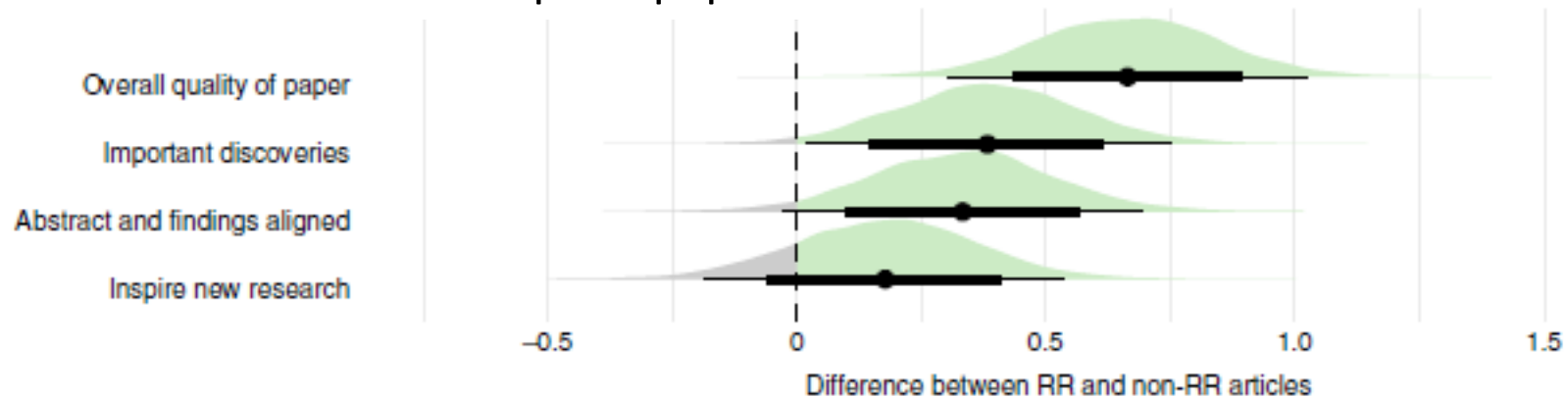
Before results



After results



Complete paper



Registered Reports vs Pre-registration vs Clinical Trial registration

All:

- Addresses unreported flexibility in conducting statistical analyses.
- Makes a clear distinction between planned, confirmatory research and unplanned, discovery research.

Only RRs and Clinical trials:

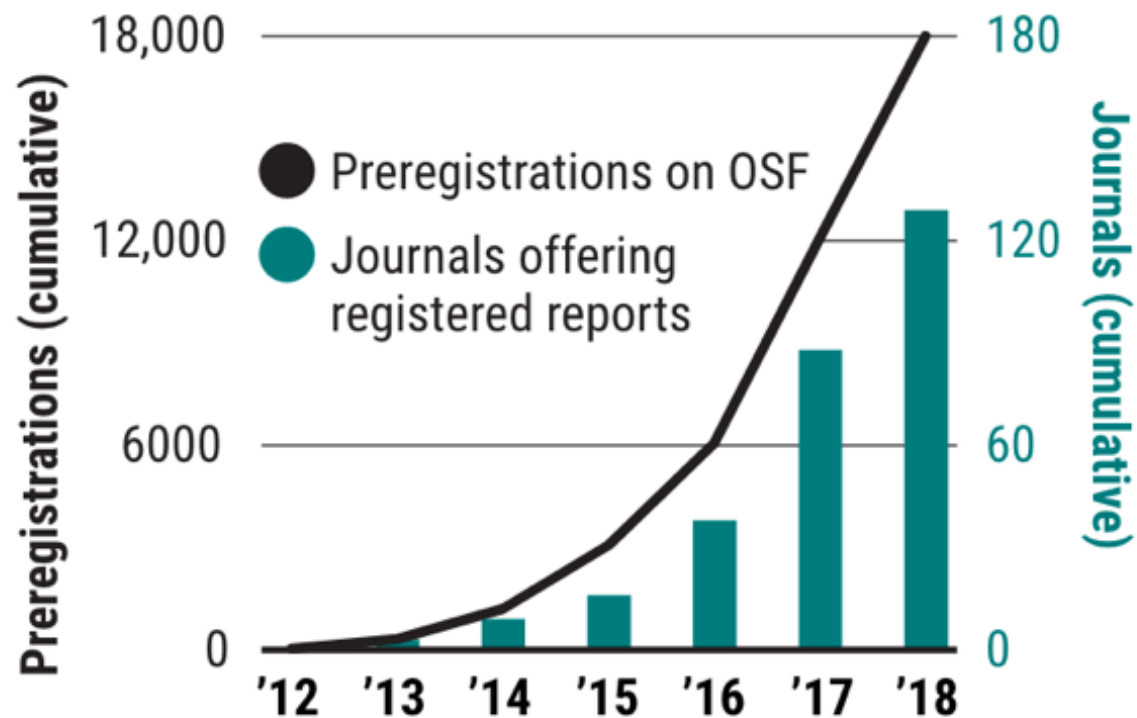
- Review process before data collection

Only RRs:

- Continuity of the review process (Authors remain true to registered protocol)
- Possible lack of details in definition of methodology and reported results
- Guaranteed publication

RRs implementations:

Study preregistrations on the Open Science Framework (OSF) are doubling every year; more than 120 journals have introduced registered reports.



J. YOU/SCIENCE

PCI-RRs

<https://rr.peercommunityin.org>

Researcher-run organisation that publishes the peer-reviews of preprints

Advantages:

- Transparent review process
- Target journal can be decided after review process (PCI_RR friendly journals)
- Speeded review process

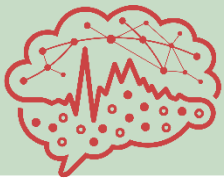
RRs and collaborative projects

EEGmanylabs

EEGmanypipelines

Psychological science Accelerator

The big TMS data collaboration



EEGmany labs

#EEG

<https://osf.io/yb3pq/>

AIM: To assess replicability of the most influential psychological studies employing EEG

27 studies
> 200 labs

CORE TEAM

Project Coordinators
General management

Advisory Board
EEG experts

Lead Replicating Labs
Coordinate replications

REPLICATION TEAMS

Replication Team #1

LAB 1 – Lead LAB 2 LAB 3 ... LAB n

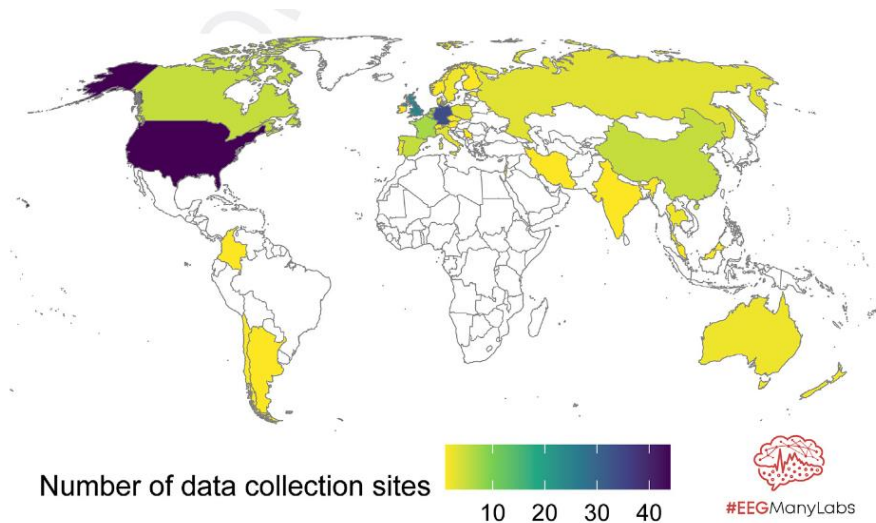
Replication Team #N

LAB 1 – Lead LAB 2 LAB 3 ... LAB n



#EEGManyLabs

Pavlov et al 2021 Cortex



EEGmanypipelines

<https://www.eegmanypipelines.org/>

AIM: To map how different pre-processing and analysis steps impact the results in EEG

Enrolling analysts by Oct 3rd

Running analyses by April 2022

Multi-analysts:

Anyone with sufficient EEG experience can participate

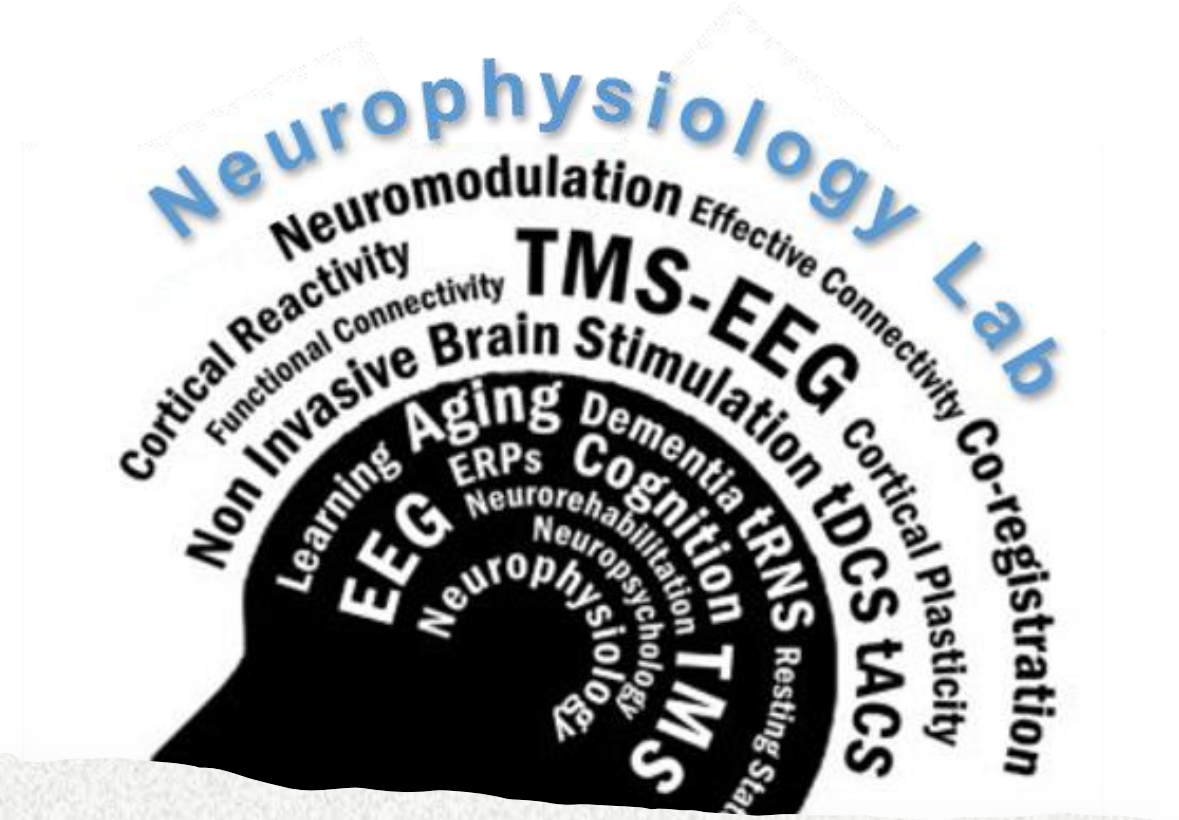
1 dataset:

33 subjects each completing about 1200 trials, recorded with a 64-channel system

All analyses require that time-domain (ERPs) or time-frequency-domain (TFRs) data between two conditions are compared for differences

Incentives and rewards





GRAZIE PER L'ATTENZIONE