



# Book of Abstracts ITRN 2026

The Present of Research is Open

**Verona**  
**13 February, 2026**

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INNOVATION MEDICINE**



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# General information

## Venue:

The conference will take place at the [University of Verona](#) in the Lecture Hall "T5 - Caprioli", Palazzo di Lingue Block (Via S. Francesco, 22 - 37129 Verona).

The block is located in the "Veronetta" district, on the left shore of the river Adige, and close to the city center (10 minutes by walk).

Nearby, there are hotels and B&Bs that offer numerous possibilities for accommodation.

To assist with your travel preparations, we have curated a Google Map featuring various locations that may be of interest to you, including the conference venue, the Highway Exits, the Railway Stations, Cultural sites, and dining areas.

Please access the map via the following link:

<https://www.google.com/maps/d/u/0/edit?mid=1UsAU7i8r7ZoVsG-pYWRcMO213vQd2eo&usp=sharing>

## How to reach Verona

Thanks to its location, at the crossroads of important motorway and railway networks, Verona is easily accessible from the main Italian and European cities by car, train, and plane.

### By car

Verona is located at the intersection of the A22 Modena-Brennero and the A4 Serenissima motorways.

Highway exits:

1. Verona Sud (on A4)
2. Verona Est (on A4)
3. Verona Nord (on A22)

Create your own route with <http://www.google.com/maps/> or [www.viamichelin.com](http://www.viamichelin.com)

### By train

There are two railway stations in Verona:

- Verona Porta Nuova (Piazzale XXV Aprile, [www.veronaportanuova.it](http://www.veronaportanuova.it))
- Verona Porta Vescovo (only Trenitalia Trains)

For timetables check the [Trenitalia website](#) or the [Italo website](#) (only Verona Porta Nuova Station)

# Programme

## Morning

09:00 – 09:30 - Registration

09:30 – 10:00 - Introduction

Plenary Session: “The Present of Research is Open”

- 10:00 - 10:45 - *Juliana Elisa Raffaghelli* (University of Padova) – *Open Science and qualitative data*
- 10:45 Coffee Break - offered by the PhD course in Human Sciences - UniVR
- 11:00 - 11:45 - *Sabina Leonelli* (Technical University of Munich) – *The philosophy of Open Science*

11:45 – Poster Session

## Afternoon

13:00 – Lunch

14:30 – Working Groups and ITRN Members’ Activities

15:30 – Coffee Break - offered by the PhD course in Human Sciences - UniVR

16:00 – ITRN Awards 2026

17:00 – ITRN General Assembly

## ITRN 2026 Award Winners

These works, submitted in the categories *Original Experimental Work*, *Open Science Tools*, and *Reproduction/Replication of Previous Work*, have been selected to receive the ITRN Award, generously sponsored this year by Springer Nature Ltd., and will be presented orally.

## Oral Presentation 1

# Disentangling the dorsal visual stream's role in shape recognition: A tractography-based ccPAS Registered Report

*Authors: Elena Bertacco, Francesca Saviola, Edoardo Paolini, Agnese Tamanti, Nicolò Cardobi, Francesca Benedetta Pizzini, Silvia Francesca Storti, Debora Brignani, Silvia Savazzi, Daniele Corbo, Chiara Bagattini, Chiara Mazzi*

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### Abstract

This study aims to inform the ongoing debate regarding the role of the dorsal visual stream in visual processing. Specifically, our goal is to disentangle the causal role of the dorsal stream in object shape recognition through an individualized tractography-based cortico-cortical Paired Associative Stimulation (ccPAS) protocol. Dorsal stream connectivity will be modulated using one critical ccPAS protocol, with an Inter-Stimulus Interval (ISI) of 9ms, and two control ccPAS protocols (0ms ISI and 30ms ISI). The behavioral effects will be assessed using a two-alternative forced-choice match-to-sample visual discrimination task, administered immediately before and after the stimulation protocol, which distinguishes between global shape and local feature processing of objects. The present project has been submitted as a Registered Report and has received the In-Principle Acceptance.

We believe that the RR format provides a robust framework to establish a rigorous paradigm. Through the preliminary review process, we can transparently report the impact of our methodological choices, addressing a critical issue in the ccPAS literature: the variability in reported procedures and induced modulation effects. All pilot stimuli, data, and analysis codes are publicly available on OSF. Complete datasets and codes will be shared before the second stage of review. Our codes document all protocol and analysis steps, including the required packages, to ensure reproducibility. While behavioral tasks are implemented in proprietary software (i.e., MATLAB, E-Prime), the underlying logic is readily transferable to open-source alternatives (e.g., Python, PsychoPy). Tractography analyses rely exclusively on open-source tools (i.e., bash).

doi: [10.5281/zenodo.14217814](https://doi.org/10.5281/zenodo.14217814); pre-registration: <https://zenodo.org/records/15658014>

## Oral Presentation 2

# Lend an Open Hand: A Fully Open Crash Course on TMS-EEG Preprocessing

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### **Abstract**

Neuroimaging data are often contaminated by a large number of artefacts. To separate the signal from the noise, researchers feed those data through complex preprocessing pipelines that include a mixture of automated approaches and subjective ratings. Mastering such pipelines is a core skill for neuroscientists, who need to understand the machinery behind automated approaches and exercise their judgement during subjective ratings. However, neuroscience students receive little training on these matters, as courses tend to skip data analysis or stop at abstract descriptions of the main analytic steps. This educational gap contributes to the reproducibility crisis, as insufficiently trained students become researchers with little awareness of good analytic practices. To fill this gap, universities have started to propose hands-on data analysis training alongside theoretical lectures. However, such training is often based on paid software and focuses exclusively on the preprocessing itself, neglecting equally important aspects like the role of free and open source software, FAIR data, computational reproducibility, and good programming practices. Therefore, I have developed a hands-on activity that guides master's students through a traditional TMS-EEG preprocessing pipeline — with an eye to reproducibility. The activity is built entirely on Python code, Jupyter Notebooks, a GitHub repository, and a redistribution of FAIR data. The use of Anaconda environments maximises computational reproducibility, and students are encouraged to pick up reproducibility skills like version control, environment management, and clean coding. All the teaching material is publicly available via GitHub (<https://github.com/coneco-lab/brainstim-multimodal>) and reusable under a custom license.

## Oral Presentation 3

# The Foreign Language Effect On The Illusion Of Causality: A Replication Attempt And An Explorative Analysis Of The Mechanisms

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### **Abstract**

Some studies on the illusion of causality (which is a cognitive bias that leads people to erroneously infer a causal relationship between unrelated events) have suggested that specific indirect manipulations of stimuli may reduce the magnitude of this bias. Such manipulations include, for example, perceptual disfluency or the use of a foreign language during the presentation of the task used to elicit the illusion (i.e., foreign language effect). In light of previous evidence already indicating the ineffectiveness of perceptual disfluency in mitigating the illusion of causality (Dalla Bona & Vicovaro, 2024), the present second study focused on the foreign language effect. Specifically, we investigated not only the effectiveness of this manipulation, but also the possible psychological mechanisms underlying any potential effect. The study involved a total of 220 Italian participants, divided into two groups: one completed the illusion task in English ( $n = 110$ ), while the other completed it in Italian ( $n = 110$ ).

Sample size was determined a priori using an informative fixed-N Bayes Factor Design Analysis to support either the presence or an absence of an effect (see supplementary materials on OSF File Tab/GitHub -- see the README file:

[https://osf.io/hvgkx/?view\\_only=7098178875224cf3b0b6890b209432ea](https://osf.io/hvgkx/?view_only=7098178875224cf3b0b6890b209432ea)).

The results did not show any significant reduction of the illusion of causality ( $BF_{01} \sim 365$ ) in the group that performed the task in a foreign language compared to the native-language group, confirming that indirect manipulations aimed at reducing the illusion of causality are not reliably replicable (see supplementary documents on OSF File Tab/GitHub:

[https://osf.io/hvgkx/?view\\_only=7098178875224cf3b0b6890b209432ea](https://osf.io/hvgkx/?view_only=7098178875224cf3b0b6890b209432ea)). These effects should therefore be considered null or, at best, extremely weak and inconsistent.

The study was preregistered, and a design analysis was conducted to determine the sample size. A preliminary draft explaining the experiment, the rationale and the design is available on the OSF page. The experimental code (PsychoPy) is publicly accessible, as are the raw data and the data-processing pipeline used to extract the final dataset. In addition, the analysis scripts (in various format) for full replication, are provided.

doi: <https://doi.org/10.17605/OSF.IO/HVGKX>

Pre-registration:

[https://osf.io/pzx9n/overview?view\\_only=cb7cc6e4da824458a2f4df145c3b7e8f](https://osf.io/pzx9n/overview?view_only=cb7cc6e4da824458a2f4df145c3b7e8f)

## Open Science Kickstart

Proposals for projects not yet started, where participants outline how they plan to integrate Open Science principles. This last category is also designed as a **space for discussion and feedback**, allowing presenters to seek advice and support on how to best implement Open Science in their work.

Poster n. 1

## Does EMDR Really Work? A Multiverse Meta-Analysis of PTSD Treatment Efficacy

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### **Abstract**

Eye Movement Desensitization and Reprocessing (EMDR) therapy is a guideline-recommended treatment for Post-Traumatic Stress Disorder (PTSD), yet its estimated efficacy and proposed mechanisms remain debated. Existing meta-analyses yield inconsistent conclusions, potentially due to unacknowledged researchers' degrees of freedom in study selection, outcome operationalization, and model specification.

The aim of this PhD project is to conduct a fully Open Science–driven Multiverse Meta-Analysis to assess the robustness of EMDR efficacy for PTSD treatment. All research questions, hypotheses, and analytic protocols will be preregistered; all data, code, and decision pathways will be openly shared on the Open Science Framework (OSF). A crowdsourced pathway elicitation procedure, combining systematic reviews and expert knowledge elicitation, will be used to define a transparent and non-arbitrary multiverse of defensible meta-analytic choices. To move beyond descriptive multiverse summaries, Post-selection Inference for Multiverse Analysis (PIMA) will be applied. PIMA is an inferential, permutation-based, non-parametric framework that controls Type I error inflation across thousands of correlated analytical paths while maintaining good statistical power.

Beyond assessing EMDR efficacy for PTSD treatment, this project proposes a generalizable inferential framework for evidence synthesis by integrating Multiverse Meta-Analysis with Post-selection Inference (PIMA). By embedding preregistration, crowdsourced analytic decisions, and open data and code into the analytic pipeline, it aims to demonstrate how reproducibility and valid inference can be jointly strengthened.

Poster n. 2

## Binding Mechanisms in lifespan: a university project

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### **Abstract**

The project aims to study binding mechanisms, defined as the brain's ability to create a "bond" between different types of information to generate a coherent representation, from a lifespan perspective. These "bonds" can involve various aspects: memory (memory binding), the intention to act (intentional binding), and the subjective sense of the passage of time between two events (temporal binding). Finally, binding mechanisms can also concern more abstract information, such as generalisations of rules (i.e., representational binding). For this purpose, a sample of 280 control subjects will be recruited and stratified into 10 age groups to monitor changes in different forms of binding across the lifespan.

To conduct this research, a range of open science tools will be applied. To ensure transparent and effective data management, a data management plan has been developed. The study will first involve obtaining informed consent, followed by a session in which anamnestic questionnaires and a neuropsychological assessment will be administered. Subsequently, participants will complete computerised behavioural tasks. Each participant will be assigned a unique identification code to ensure anonymity. The collected data will be stored in an internal university repository, accessible only to the test administrator and the principal investigator. Data will be presented in anonymized and aggregated form. Data analyses will be conducted using the R software environment to ensure code and research reproducibility. In view of future publication, all materials will be made available in open access; analysis scripts will be shared in accordance with FAIR principles.

Poster n. 3

## Open-Source Digital Pathology and AI for Addressing Cancer of Unknown Primary

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### **Abstract**

Cancer of Unknown Primary (CUP) is one of the most challenging problems in oncology: doctors can see metastatic tumors, but cannot identify where they originally started. Without knowing the tissue of origin, it becomes much harder to choose the most effective treatment. This project addresses this challenge by combining digital pathology and artificial intelligence, starting not from closed clinical datasets, but from open science—using publicly available data and open-source tools.

In this early phase, we built a prototype dataset using whole-slide pathology images from The Cancer Genome Atlas. Only high-quality, well-preserved diagnostic slides were selected. Using freely available software, including QuPath and Python-based tools, the images were organized, visualized, and prepared for expert-guided annotation. Bladder cancer was chosen as a first test case, allowing us to develop clear strategies to separate tumor from normal tissue and to extract meaningful visual features.

What makes this project unique is not only its medical goal, but how it is built. Every step—from data collection to analysis—is based on open resources. Open datasets allowed the project to start without institutional barriers, and open-source tools ensured that every decision is transparent and reproducible. This openness allows faster development, easier validation by others, and strong potential for collaboration.

In the future, this framework will be expanded to include multiple organs and combined with molecular and pathway information to support biologically meaningful predictions of tumor origin in CUP. By placing open science at the center of development, this work shows how accessibility, transparency, and innovation can grow together to support clinically useful AI in cancer diagnosis.

## Original Experimental Work

Presentation of new research studies conducted using Open Science practices.

Poster n. 4

## PandHEMOT®: An Open Science and Free Psychoeducational App for Enhancing Children and Adolescents' Understanding of Pandemics/Epidemics, Emotions, and Emotion Regulation

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### **Abstract**

The General Conference of the United Nations Educational, Scientific, and Cultural Organization (UNESCO, 2021) emphasized the urgency of promoting open science practices to address societal challenges, including natural disasters. In this context, scholars have the responsibility to promote people's well-being by implementing solutions that are freely available to a wide audience. Accordingly, we developed PandHEMOT® (Pandemics – Helmet for EMOTions), a psychoeducational app for children and adolescents. It comprises 10 levels that explain pandemics/epidemics, safety measures, emotions, and emotion regulation, integrating knowledge from medicine, civil protection, and psychology. Its content was developed in dialogue with practitioners and community members (Rocca et al., 2023), reflecting one of UNESCO's (2021) key pillars for open science, namely open engagement of societal actors. We tested the efficacy of this tool involving 147 third- and seventh-graders from Northern Italy, divided into an experimental group (participating in a three-unit training) and a control group (receiving training after the testing phase). Both groups completed pre- and post-test questionnaires assessing their knowledge. Conducting generalized linear mixed models and linear mixed models, we confirmed the efficacy of the training in increasing children and adolescents' knowledge about the app contents. In line with another key pillar of open science, namely open scientific knowledge (UNESCO, 2021), the related peer-reviewed journal article was published open access (Raccanello et al., 2024), and PandHEMOT® is freely available for download from the Google Play Store ([https://play.google.com/store/apps/details?id=appinventor.ai\\_robert\\_butter.PandHEMOT](https://play.google.com/store/apps/details?id=appinventor.ai_robert_butter.PandHEMOT)).

doi: <https://doi.org/10.1111/aphw.12511>

Poster n. 5

## Probing Perceptual Awareness and Post-Perceptual Processes through Fast Optical Imaging: a Registered Report

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### **Abstract**

Dissociating the neural mechanisms underlying visual awareness from post-perceptual, response-related processes represents a central challenge in consciousness research.

To achieve this goal, the present study employed a unique experimental design in which both awareness and motor response were manipulated. Specifically, participants performed a GO/NOGO detection task, in which they were asked to respond or withhold responding according to the experimental condition. Critically, participants' brain activity was recorded using the Event-Related Optical Signal (EROS) technique, which provides accurate information about brain functions both from the temporal and spatial point of view, simultaneously. Pilot results from a small sample revealed that the Lateral Occipital Complex (LOC) plays a crucial role in conscious vision independently of the response requirement. In contrast, activity in the primary visual cortex (V1) characterized the conscious condition only when the response was required. In general, these results suggest a central role for LOC in conscious vision, indicating that it could represent a reliable neural correlate of visual awareness, as opposed to V1, whose activity seems to be related to post-perceptual processes involved in the requirement of report.

This study fully aligns with the principles of open science, as it was submitted (and received the PCI RR Stage 1 in-principle acceptance) as a Registered Report, with hypotheses, experimental design, and analysis plan defined and evaluated prior to data collection. In addition, to ensure methodological transparency and enhance the robustness and replicability of the findings, the data from the pilot experiment have been made publicly available on the OSF platform.

doi: <https://doi.org/10.1101/2024.04.23.590726>;

Pre-registration: <https://doi.org/10.1101/2024.04.23.590726>

Poster n. 6

## Adaptation of the mousetracking metrics to explore chronesthesia: evidence from the Mental-Time-Line task

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### **Abstract**

#### Introduction

Mouse tracking is a widely adopted experimental technique with a tradition spanning more than 20 years (Spivey, Grosjean, & Knoblich, 2005). Originally developed to capture spatiotemporal hand movement trajectories during decision-making or categorisation tasks, mouse tracking metrics are assumed to reflect the cognitive processes underlying preference for different choices (Wulff et al., 2025). However, among the psychological processes investigated through this technique, subjective time referred as chronesthesia (Tulving, 2002) was never considered.

#### Methods

To bridge this gap we set up a Mental-Time-Line paradigm (Arzy et al., 2009) and asked participants to graphically represent their life by dragging and dropping with the mouse three temporal markers (N birth, P present, F future) on a horizontal line, representing the average human life span. The task was developed using OpenSesame in PsychoPy environment (Maathot et al., 2012). The logic behind the Python code implemented for recording cursor trajectories during drag-and-drop (Nelli, 2024) was developed after a confrontation with Pascal Kieslich (Kieslich, 2024).

The tracking data were processed to obtain classic tracking metrics with the available mousetrap library in R (Kieslich & Henningher, 2017) such as RT, MAD\_time, xpos\_flips, sample entropy, initiation time, MAX\_speed and MAX\_acceleration.

#### Results

Principal Component Analysis (PCA) with Varimax rotation highlighted a bifactorial structure

for the three temporal markers explored separately (N, P, F). In each PCA, the first factor described the control and conflict of the cognitive dynamics underlying the temporal representations processing, grouping timing and conflict indexes. The second factor described the motor dynamics, grouping exclusively peak kinematic indexes.

### Conclusion

Overall, the results show how the PCA on movements' spatiotemporal development dynamics in a Mental-Time-Line paradigm is consistent with mouse-tracking literature, reflecting a cognitive-motor bifactorial structure. The codes for running the Mental-Time-Line experiment, to extrapolate tracking measures and to compute the PCA are available on open-source repositories.

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Poster n. 7

## Embodied Processes, Interoceptive Activation, and Interpersonal Dynamics in Online Vocal Conversations Across Levels of Abstractness and Age Groups

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### **Abstract**

We investigated, in dyads across different age groups, whether online vocal conversations without visual feedback shape social dynamics between interlocutors as a function of interaction quality, conversational content (more vs. less abstract), and perceived similarity. Age and gender-matched dyads (64 younger participants, M age = 24.28; 48 older participants, M age = 73.27) were asked to talk online for 5 minutes about different concepts (e.g., “coat”, “immortality”). After the conversation, we measured perceived pleasantness, intimacy, and difficulty, self, other’s contribution to the conversation, and commitment. Closeness was assessed using Visual Analogue Scales (VAS) and the Inclusion of Other in the Self (IOS) measure. We also administered an imitation–inhibition task, informing participants that the observed hand belonged to their paired interlocutor. Finally, participants’ perceived interoceptive and exteroceptive activation in both their own and the other’s body was assessed using the Body Painting Task. Results showed that the greater the other’s contribution, the pleasantness, intimacy and similarity, the higher the physical and psychological interpersonal closeness. Moreover, conversations about abstract concepts were associated with a greater interpersonal closeness. After discussing abstract concepts, higher perceived similarity predicted faster motor responsiveness in younger participants, whereas greater perceived difficulty predicted slower motor responsiveness in older participants. Overall, greater self contribution to the conversation was associated with slower motor responsiveness. Younger interlocutors reported stronger bodily activation than older ones after the conversation and perceived their own body as more activated than the other’s body. In the older sample, greater other-contribution was associated with stronger bodily activation.

Poster n. 8

## Intention to Leave and Intention to Stay: Meaning of Work and Quality of Working Life. The Case of Midwifery profession

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### **Abstract**

This study addresses the phenomenon of Intention to Leave (ITL) within the Italian healthcare context, primarily focusing on the midwifery profession. Defined as the inclination to quit one's job or, more broadly, the profession itself, ITL is widely recognized in literature as a robust and reliable predictor of actual turnover. The exodus of qualified midwives represents a serious threat to the sustainability of maternal and newborn health services, directly impacting the quality of care and clinical outcomes for both women and infants.

### Determinants and Theoretical Framework

The causes underlying this intention are complex and multifactorial, rooted in organizational, occupational, social, and psychological dynamics. The primary triggers include chronic occupational stress, professional burnout, perceptions of inadequate workload, lack of managerial and peer support, unsatisfactory professional development opportunities, work-life conflict, and a misalignment between the meaning of work attributed by the professional (e.g., quality and continuity of care, woman-centered care, professional autonomy) and organizational values (e.g., productivity and resource optimization). These elements undermine job satisfaction and professional resilience.

### Research Methodology

This research project operates within a limited landscape of validated Italian studies analyzing the complex interconnection of these factors in the midwifery sector. It adopts an approach aligned with international research methodologies, such as those promoted by the WHELM project (Work, Health and Emotional Lives of Midwives), to investigate the multifaceted nature of ITL and its predictors nationally.

The analysis follows a rigorous path, starting with a thorough examination of the intrinsic meaning and value individuals assign to their work. Subsequently, the investigation systematically identifies the multiple factors defining the Quality of Working Life (QWL). The ultimate goal is to achieve a more accurate and detailed identification and measurement of the elements underlying the potential choice to leave the organization and/or the profession.

### Aims and Study Design

The primary objective is to identify the social, psychological, demographic, and organizational factors influencing the intention to leave or, conversely, supporting the Intention to Stay (ITS). The study employs a multicenter, cross-sectional design to obtain a detailed description of the phenomenon based on data provided directly by midwives.

### Participants and Tools

The research involves a survey of employed midwives (excluding freelancers) working in various hospital and community health facilities within the Province of Verona. The survey instrument is structured into several sections using a combination of validated tools:

- (a) A socio-demographic form;
- (b) A grid of sociological elements regarding work culture and quality of working life (Gosetti 2022);
- (c) Three validated scales:
  - Perceptions of Empowerment in Midwifery Scale Revised (PEMS-R, Fumagalli et al. 2022);
  - Depression Anxiety and Stress Scale 21 (DASS-21, Bottesi et al. 2015);
  - Copenhagen Burnout Inventory (CBI, Aiello et al. 2022).

The survey also includes open-ended questions designed to collect personal narratives and motivations regarding the choice to leave, as well as suggestions for corporate support strategies.

### Current Status

The research project is currently in the data collection phase (administration of survey instruments).

Poster n. 9

## Learning by Doing Science: A Citizen Science Pilot Study

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### **Abstract**

Citizen Science is a core pillar of open science, as it promotes public engagement, transparency, and shared ownership of scientific knowledge. This poster presents a pilot Citizen Science project developed within the Science Under 18 framework, aimed at promoting sustainable food-related attitudes and behaviors among primary school children.

The project involved students from three fifth-grade classes, their teacher, university researchers, and local Science Under 18 coordinators. Children were actively engaged not only as participants but also as co-creators of the research process. A mixed-methods design was adopted, combining both implicit and self-report measures to assess attitudes, intentions, and behaviors related to sustainable eating. In line with open science principles, students collaborated in the construction of a second questionnaire, administered to parents and teachers, and publicly presented the results during a science festival hosted at the University of Milan-Bicocca.

Beyond outcome measures, the project incorporated a structured process analysis inspired by the evaluation frameworks for citizen science (Kieslinger et al., 2018). Feedback was collected from adult stakeholders to assess data quality, participant experience, ethical considerations, and social impact. This multidimensional evaluation highlights both the potential and the challenges of implementing citizen science in formal educational settings, particularly with respect to methodological rigor, inclusivity, and sustainability over time.

Overall, the project illustrates how citizen science can function as an open-science practice that integrates research, education, and societal engagement, while underscoring the importance of transparent methods and systematic process evaluation when involving young citizens in scientific research.

## Open Science Tools

Development or application of tools, resources, or methods that support Open Science.

Poster n. 10

## Separating Simulation, Inference, and Validation: A Reproducible Framework for Bayesian Small-N Research

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### **Abstract**

Reproducible validation of Bayesian inference remains underdeveloped in small-sample research with bounded rating data and systematic bias. We present `smallN-bias-bayesian-framework`, an open-source R tool for reproducible validation of Bayesian inference in small-N designs with rater-specific bias (available on OSF with a persistent DOI; MIT License). The tool implements a modular workflow separating data generation, estimation, and validation. Data are simulated as latent continuous outcomes observed through bounded rating scales (e.g., Likert-type), generated from normally distributed subject-level baseline scores with a fixed pre–post effect and additive rater-specific bias, then truncated to the scale bounds. The simulation design follows a repeated-measures structure with two time points (pre/post) and two raters per subject, enabling direct modeling of systematic rater bias.

Inference uses fast analytical Bayesian estimation based on closed-form solutions: difference scores are analysed via a linear model including rater bias as a covariate, with posterior distributions obtained under flat priors using analytical covariance estimates.

Inferential performance is evaluated through Monte Carlo simulations focusing on estimation bias, root mean squared error, credible interval coverage, posterior probability summaries, and Bayes factors computed via BIC-based approximation for nested models.

Reproducibility is ensured through fixed random seeds, deterministic simulation–estimation pipelines, transparent dependency management, and executable scripts enabling exact replication of all analyses; documented examples illustrate how robustness varies with sample size and systematic bias.

The framework operationalizes inferential validation as a reusable research output for small-N studies affected by rater-specific bias in the social sciences.

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Poster n. 11

## Openness through the years: Tracking the adoption of open science practices after the reproducibility crisis

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### **Abstract**

**Background:** Over the past decade, the reproducibility crisis has exposed structural weaknesses in scientific practice (Open Science Collaboration, 2015), prompting widespread calls for increased transparency and openness. In response, open science has emerged as a broad framework aimed at improving the credibility, accessibility, and cumulative nature of research. However, openness is often operationalized in fragmented ways, focusing on single practices (e.g., open data or preregistration) rather than conceptualizing transparency as a multidimensional construct.

**Objectives:** To address this limitation, we developed a composite index to quantify the degree of openness of individual research articles.

**Methods:** The index captures the presence of five core open science practices: preregistration, open access publication, open data availability, fully reproducible analyses (open-source software and shared analysis code), and fully reproducible materials (open-source software and complete availability of all research materials). Each article is scored based on the number of open science components it implements, yielding an intuitive cumulative measure of research openness.

Using this index, we randomly sampled 100 research articles published across multiple years in *Personality and Social Psychology* and in *Journal of Experimental Psychology: Learning, Memory, and Cognition* to test whether openness has increased over time. We examined the association between year of publication and the Open Science Index to assess longitudinal trends in the adoption of open practices.

**(Expected) Results:** Preliminary results will be presented in relation to publication year, highlighting whether some forms of openness have become more common over time while others remain rare. Overall, this work aims to document both the progress achieved in response to the reproducibility crisis and the persistent gaps that continue to limit full

research transparency.

#### References

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Poster n. 12

## From Flexibility to Reproducibility: A Unified MATLAB Framework for M/EEG Multiverse Analysis with HERBERT

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### Abstract

The replication crisis has highlighted how analytical flexibility, often manifesting as p-hacking or HARKing, can compromise the validity of scientific findings. While the multiverse analysis approach mitigates these issues by systematically exploring the so-called “researcher degrees of freedom”, its practical implementation remains technically demanding and prone to coding errors. In the specific domain of M/EEG signal processing, a unified framework that simplifies the orchestration of diverse analytical pathways is still missing.

Here, we present HERBERT, an open-source MATLAB toolbox currently under active development, designed to operationalize and standardize multiverse analysis in M/EEG research. HERBERT acts as a comprehensive wrapper around state-of-the-art neuroimaging libraries, enabling researchers to construct, execute, and compare parallel analysis workflows within a single environment.

The toolbox features a highly modular architecture where functions are organized into five stages, spanning preprocessing, head modeling, source estimation, connectivity, and network analysis. Users can run the entire pipeline or execute specific modules independently, starting and ending at any stage. The entire workflow architecture and parameterization are defined via JSON configuration files, decoupling the analytical choices from the execution code. This design ensures that analysis decisions are human-readable, easily shareable, and amenable to version control. The toolbox maximizes automation while also allowing the incorporation of “human-in-the-loop” checkpoints for critical supervision. To enable reproducibility and systematic comparison across the multiverse, intermediate results can be optionally saved at each step.

By combining modularity, automation, and a transparent text-based configuration protocol, HERBERT provides a robust Open Science tool that fosters transparency, reproducibility, and replicability in electrophysiological research.

Poster n. 13

## Harnessing the Replication Eucatastrophe: Blockchain and Cryptocurrencies as Levers for Open Science

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### **Abstract**

The replication crisis may be reframed as a Replication Eucatastrophe: a disruptive yet ultimately constructive turning point that catalysed reform toward greater scientific credibility, transparency, and reproducibility. This opportunity has been taken up by the Open Science movement, whose trajectory is articulated in Nosek's (2019) Strategy for Culture Change: openness must first become possible, then easy, normative, rewarding, and ultimately required. Despite substantial progress, however, many Open Science (OS) practices remain unevenly adopted, weakly enforced, and constrained by distorted incentive structures. Against this backdrop, I propose a blockchain-based framework designed to operationalise and strengthen OS by embedding its principles directly into the research lifecycle. Integrated with existing solutions such as the Open Science Framework and Open Badges, blockchain technologies and cryptocurrencies can function as levers for OS on multiple levels by enabling immutable and verifiable records, certified credentials, incentive mechanisms and decentralised governance.

Poster n. 14

## NIBS-BIDS: A scalable BIDS datatype for organizing non-invasive brain stimulation metadata (v6.2)

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### Abstract

Non-invasive brain stimulation (NIBS) methods such as transcranial magnetic stimulation (TMS), transcranial electrical stimulation (TES), and transcranial ultrasound stimulation (TUS) are increasingly combined with neuroimaging, electrophysiology, and behavioral paradigms. However, reproducible sharing and analysis remain limited by inconsistent metadata practices and the lack of a unified, machine-readable structure for stimulation parameters and spatial targeting.

We present NIBS-BIDS (v6.2), a scalable extension proposal that organizes stimulation metadata under a dedicated `nibs`/datatype. The proposal introduces a coherent file set to describe stimulation delivery (`*_nibs.tsv + *_nibs.json`), spatial targeting and neuronavigation (`*_markers.tsv/json`), and coordinate definitions (`*_coordsystem.json`). To support multimodal synchronization, stimulation instances are represented in tabular form and can be time-locked through standard BIDS event annotations using shared identifiers (e.g., `stim_id`, `target_id`, optional `stim_count`). The structure supports multiple stimulation systems via `stimsys-<label>` and captures online vs. offline paradigms through an explicit relationship label (`rel-online / rel-offline`) within the `nibs` datatype.

NIBS-BIDS aims to lower the practical barrier to “BIDSifying” stimulation datasets while enabling consistent data discovery, validation, and downstream analyses across complex multimodal experiments. Ongoing work focuses on defining minimum recommended parameter sets for common protocols and expanding guidance for TES/TUS datasets.

## Reproduction/Replication of Previous Work

Projects aimed at validating or replicating existing studies.

Poster n. 15

## Do prestimulus alpha oscillations predict motor cortical excitability? A replication study.

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### **Abstract**

What are the essential criteria for defining replication? Can a study be considered a replication when its research question is shared with multiple prior studies rather than a single one? Does the same apply to methodology when it is derived from multiple studies? Does the inclusion of an extension involving a novel dependent variable preclude it from being classified as a replication? Here, we aim to contribute to the meta-scientific discussion on replication by presenting a case example. We investigated whether and how alpha activity in the motor cortex shapes motor excitability, a question previously examined across multiple studies. Specifically, EEG–TMS–EMG investigations reported inconsistent associations between the power and phase of prestimulus alpha oscillations and motor-evoked potential (MEP) amplitude. In our study, we tested this relationship by assessing the effect of alpha activity on MEP amplitude in a pre-registered conceptual replication. In addition, we extended prior work by examining alpha effects on immediate TMS-related power (i-TRP), a recently identified EEG signal reflecting motor excitability within the first 6 ms following the TMS pulse. This work includes replication of previous studies and an extension in methodology to answer the same question, fostering discussion on how replication should be defined and evaluated in neuroscience.







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