Magdalena Sabat

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Education

École Normale Supérieure - PSL, Paris, France — September 2021 – November 2024
PhD in Cognitive Science, Department of Cognitive Science
Graduated with distinction (*félicitations* from the jury)

École Normale Supérieure - PSL, Paris, France — September 2019 – June 2022
Advanced Research Master (Diplôme de l'ENS) in Cognitive Science
Minor in Biology

Université Sorbonne Paris Nord, Villetaneuse, France — September 2018 – June 2019
Erasmus+ program, Department of Psychology

Jagiellonian University, Cracow, Poland — September 2016 – July 2019
Bachelor Degree in Cognitive Science, Department of Philosophy
4.35/5/5 [GPA/thesis/defense]; Dean's List

Monroe College, New Rochelle, NY, USA — September 2014 – January 2015
Management *(Discontinued)*

Experience

Leiden University & Amsterdam University
Postdoctoral Researcher — January 2025 – current
Supervisors: Anne E. Urai & Jan W. Bolderdijk
Topic: Predict the tip - conflict as an early inidcator of social tipping points
Current social norms are unsustainable, making behavior change crucial for addressing the climate crisis. Social norms can shift rapidly after tipping points, but these are often only recognized in hindsight. To promote change, we need better predictive power, i.e. ability to detect early warning signs that a tipping point is about to happen. We explore a new angle: the emergence of decisional conflict may predict that a tipping point in behaviors is near. Recognizing such decisional conflict (WP1) and timing policies accordingly (WP2) may thus help to speed up societal change. Leveraging methods from social, cognitive, and computational sciences, using lab experiments, real world data, and computational modelling, we test whether various measures of conflict can be a sign of impending transitions in societal dynamics. Together, we aim to broaden our fundamental understanding of the emergence of social norms, building a foundation for targeted and effective interventions.

Sabbatical
Mental and physical well-being focus — January 2025 – December 2025

Laboratoire des Systèmes Perceptifs (ENS - PSL)
PhD Researcher — February 2020 – November 2024
Supervisor: Yves Boubenec
Topic: The organisation of temporal integration in the auditory cortex at a cellular level.
I worked with intracranial neurophysiology in awake animal models of auditory perception. I designed and built training and experimental setups to condition animals and record peripheral and intracranial signals. I completed full neurosurgical training and authored experimental papers in my doctoral thesis on temporal integration across the auditory hierarchy. I also investigated how internal state, indexed by peripheral physiology, shapes auditory encoding. This work provided comprehensive training in designing, conducting, analyzing, and publishing research in cognitive computational neuroscience.

Laboratoire de Neurosciences Cognitives & Computationelles (LNC2), INSERM (U960)
Researcher — September 2019 – November 2024
Supervisor: Catherine Tallon-Baudry
Topic: Literature analysis on the concept of arousal and neuroimaging meta-analysis.
I explored core questions in cognitive neuroscience, such as the brain–behavior relationship and the definition of concepts in cognitive science. I conducted a literature review using natural language processing to examine arousal in a data-driven way and performed neuroimaging meta-analyses with advanced computational methods. This work

addressed a key controversy in the field and provided me with strong analytical skills and expertise in state-of-the-art computational tools for cognitive science.

LaPsyDé – UMR CNRS 8240, Université de Paris
Intern February 2021 – June 2021
Supervisor: Grégoire Borst
Topic: Development of implicit conflict detection in children – effects on reinforcement learning.
In this project, we investigated the external validity of a computational model of executive functions. Using a reinforcement learning framework, we tested whether parameters from a standard RL task could predict logical-mathematical abilities or their development. I collected data from 8–12-year-old children in Parisian schools and from 400 adults online. The project is ongoing, with final analyses and publication in preparation.

Neurocognitive Processing Laboratory, Jagiellonian University
Research Assistant November 2017 – July 2018
Supervisor: Adam Chuderski
Mechanisms of visual working memory (project number: 2015/17/B/HS6/04152) financed by The National Science Center (OPUS 9). Collection and pre-processing of EEG data.

Cognitive Engineering Lab, Jagiellonian University
Intern December 2016 – May 2018
Supervisor: Michał Klincewicz
Acquired funding and carried out a project "Virtual Reality workstation preparation and replication of the Schatzschneider, Bruder, Steinicke (2016) Who turned the clock? Effects of Manipulated Zeitgebers, Cognitive Load and Immersion on Time Perception"; conducted a behavioral experiment from procedure programming to data analysis.

Cognitive Science Student Association, Jagiellonian University
Vice-president September 2018 – July 2019

Cracow Cognitive Science Conference Organizational Committee, Jagiellonian University
Main Coordinator September 2018 – June 2019

Scholarships and Grants

FYSSEN Postdoctoral grant (90000€) July 2025 for 2 years
COSYNE 2024 Travel Grant (500€) March 2024
Frontiers in Cognition Graduate School Funding (ENS - PSL) September 2019 – June 2024
Fully funded 5-year Master + PhD program
ERASMUS+ Scholarship (Jagiellonian University) September 2018 – June 2019
Awarded for a 10-month international exchange in Paris, France (4500€)
Dean's Scholarship for Best Students (Jagiellonian University) October 2018 – June 2019
Merit scholarship, 3 awarded among 3rd year CogSci students (8000 PLN)
Pro-Quality Student Development Grant (Jagiellonian University) Spring 2018
Travel funds awarded towards participation in 2 different conferences (600PLN) and grant for VR workstation preparation (3000PLN)

Publications

Sabat, M., Gouyette, H., Gaucher, Q., Espejo, M., David, S., Norman-Haignere, S.V., Boubenec, Y. (2025) Neurons in auditory cortex integrate information within a constrained and context-invariant temporal window. *Current Biology, 35* (24), 6114-6125.e7, https://doi.org/10.1016/j.cub.2025.11.011. *Preprint*: bioRxiv 2025.02.14.637944; https://doi.org/10.1101/2025.02.14.637944

Sabat, M., de Dampierre, C., Tallon-Baudry, C. (2025) Evidence for domain-general arousal from semantic and neuroimaging meta-analyses reconciles opposing views on arousal. *Proc. Natl. Acad. Sci. U.S.A. 122* (6) e2413808122, https://doi.org/10.1073/pnas.2413808122. *Preprint*: bioRxiv 2024.05.27.594944; https://doi.org/10.1101/2024.05.27.594944v2.

Sabat, M. (2019). Dilation and pupillary light response as indicators of separate covert attention mechanisms. *Bachelor Thesis*.

Sabat, M., Haladus, B., Klincewicz, M., Nalepa, G.J. (2022). Cognitive load, fatigue and aversive simulator symptoms but not manipulated zeitgebers affect duration perception in virtual reality. *Scientific Reports, 12,* 15689. https://doi.org/10.1038/s41598-022-18520-1

Sabat, M., Gouyette, H., Gaucher, Q., Boubenec, Y. "Affordable end-to-end ECG and respiration record-

ing system with robust denoising using artificial neural networks in awake animals." (accepted presubmission at Cell Reports Methods).

Teaching

Introduction to Cognitive Psychology (WSB Merito) Spring 2025
Lecturer, Psychology Bachelor, year 1, 8 hours of lectures
Introduction to Cognitive Science (ENS-PSL) Spring 2022, Fall 2022, Spring 2023
Teaching Assistant, CPES, Bachelor, year 2, 12 hours of tutorials

Supervision

Hortense Gouyette, Cogmaster student Spring 2023 – Spring 2024
Supervision of a 6-month full-time internship on electrophysiological recording techniques in ferrets; output: dataset of electrophysiology and peripheral measurements.
Sonakshi Gupta, IMaLiS student (M2 internship) Spring 2023
Supervised replication of a study with Gregoire Borst (2021) on adults and children; output: full replication of results.
Agathe Bredel, Normalien ENS Fall 2022 – Spring 2023
Year-long internship supervision; output: poster describing experimental setup protocol.

Workshops

Qlife Winter School – Learning and Plasticity in Neural Networks, Paris, France (March 2024)
Neuromatch Academy, Worldwide (July 2020)
Practical MEEG, Paris, France (December 2019)
International Workshop on Functional Ultrasound of the Brain, Corsica, France (October 2019)

Seminars & Conferences

COSYNE 2024, Lisbon, Portugal (March 2024) – Poster: "Time-limited integration windows constrain and organize hierarchical computation in ferret auditory cortex."
Electronic Auditory Research Seminars (online, 12/12/2023) "Time-limited integration windows constrain and organize hierarchical computation in ferret auditory cortex." (Recording: https://www.med.upenn.edu/pennhearing/ears.html)
Basic Auditory Science Conference, London, UK (September 2023) – Poster: "What is the auditory cortex waiting for?"
Mind Brain Body Symposium, Berlin, Germany (March 2023) – Poster: "What is arousal? Big data semantic analysis and neuroimaging meta-analysis."
The 7th International Conference on Auditory Cortex, Magdeburg, Germany (September 2022) – Poster: "Plasticity of temporal integration in ferret auditory cortex."
FENS Forum, Paris, France (July 2022) – Poster: "What is arousal? An automatic analysis of 50,000 scientific articles."
Przyszłość w Nowym Wymiarze..., Cracow, Poland (June 2018) – Talk: "Zaburzenia percepcji w środowiskach Wirtualnej Rzeczywistości"
X Cracow Cognitive Science Conference, Cracow, Poland (May 2018) – Poster: "Time perception in Virtual Reality"
Zderzenia Poznawcze, Warsaw, Poland (May 2018) – Talk: "Effects of Manipulated Zeitgebers, Cognitive Load and Immersion on Time Estimation"
III Studencko-Doktoranckie Warsztaty, Pobierowo, Poland (March 2018) – Talk: "Disturbance of Perception in Virtual Reality Environments"

Skills

Languages: Polish (native), English (C1), French (B2)
Other skills: Proficiency in MS Office and internet research; data analysis using MATLAB, Python & JASP; procedure programming in MATLAB (PsychToolbox) & Python (PsychoPy); document formatting with LaTeX; experimental setup design using Raspberry Pi, Arduino; literature review and fMRI meta-analysis using deep learning and statistical models; computational modelling using scikit-learn.