

Mirko Thalmann, Ph.D.

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Work History

- 2024/02 – current 📌 **Postdoc**, *Helmholtz Institute for Human-Centered AI, Munich, Germany.*
- Leading research projects with the aim of understanding the adaptivity of mental representations, and the generality of learning and decision processes.
 - Supervising PhD students and Master students.
- 2021/08 – 2024/01 📌 **Postdoc**, *Max Planck Institute for Biological Cybernetics, Tuebingen, Germany.*
- Conducting a research project to understand the adaptivity of mental representations as a main researcher: study design, study execution, communication & presentation, publication.
 - Co-supervising PhD students and Master students.
- 2018/04 – 2021/06 📌 **Senior / Data Scientist**, *BonusCard.ch AG, Zurich, Switzerland.*
- Developing, evaluating, and putting machine-learning models into productive end-to-end pipelines.
 - Conducting statistical analyses (e.g., survival models, regression models) and visualizing results for business stakeholders.
 - Developing an SQL-based framework for scheduling model runs in different languages (SQL, python, and R), storing results in centralized location, and supervising models with a logging and monitoring system.
- 2014/03 – 2018/01 📌 **PhD in Cognitive & Mathematical Psychology**, *Cognitive Psychology Unit, University of Zurich, Zurich, Switzerland.*
- Title: "Chunking & Rehearsal in Working Memory: A Matter of Central Attention?".
 - Formulating hypotheses within statistical and/or computational models.
 - Designing and programming experiments.
 - Testing models on data and deriving conclusions.
 - Written and oral communication of ideas and results.
 - Lecturing seminar "Debates in Cognitive Psychology".
- 2021/08 – 2024/01 📌 **Doc.Mobility Research Stay**, *School of Psychology, UNSW, Sydney, Australia.*
- Writing a grant proposal successfully (Grant received from Swiss National Science Foundation).
 - Building a computational model predicting three different types of response data at once (recognition accuracies and RTs & recall on circular scale).
 - Fitting the model and computing model predictions.

Education & Professional Training

- 09/2021 – 02/2022  **Mathematics for Machine Learning** with DeepLearning.AI at coursera.org.
- 11/2020 – 03/2021  **Deep Learning Specialization** with DeepLearning.AI at coursera.org.
- 04/2017 – 02/2021  **Books/Self-Taught:** Statistical Rethinking, R4DS, Advanced R, Python Crash Course, Python Data Science Handbook.
- 07/2016  **Scientific Programming with python**, Physics Institute, University of Zurich.
- 06/2015  **Comput. Modeling of Cognition**, Two-week workshop, Laufen, Germany.
- 01/2014  **MSc Psychology**, Major: Cognitive Psychology and Neuropsychology, Minor: Law, University of Zurich.





Skills

- Languages  German*****, English****, French***, Italian**, Spanish*.
- Coding  R, python, SQL, \LaTeX , git, matlab, SPSS
- Misc.  Alpinism, Salsa, Cooking, Movies, Taekwondo (first Dan), Boxing





Ad-Hoc Review Activity

Cognitive Research: Principles and Implications, Cortex, Memory & Cognition, Open Mind, journal of cognition

References





- Eric Schulz  **Helmholtz Institute for Human-Centered AI**, Munich, Germany.
- Klaus Oberauer  **Cognitive Psychology Unit, University of Zurich**, Switzerland.
- Evie Vergauwe  **Working Memory, Cognition, & Development, Univ. of Geneva**, Switzerland.
- Chris Donkin  **Comp. Modeling in Psychology, Ludwigs Max. University**, Munich, Germany.

Research Publications

- 1 M. Binz, E. Akata, M. Bethge, *et al.*, “A foundation model to predict and capture human cognition,” en, *Nature*, pp. 1–8, Jul. 2025, Publisher: Nature Publishing Group, ISSN: 1476-4687.  DOI: 10.1038/s41586-025-09215-4. (visited on 08/11/2025).
- 2 S. Haridi, E. Schulz, and M. Thalmann, “Context Size and Set Size Effects: The Relevance of Specific Cues When Searching Long-Term Memory,” en, *Computational Brain & Behavior*, Aug. 2025, ISSN: 2522-087X.  DOI: 10.1007/s42113-025-00255-7. (visited on 08/11/2025).
- 3 M. Thalmann and E. Schulz, “How can we characterize human generalization and distinguish it from generalization in machines?” *Current Directions in Psychological Science*, vol. 0(0), 2025, Online first version available at <https://doi.org/10.1177/09637214251336212>.
- 4 M. Thalmann, K. Witte, and E. Schulz, “Model-based exploration is measurable across tasks but not linked to personality and psychiatric assessments,” en, *Scientific Reports*, vol. 15, no. 1, pp. 1–19, Jul. 2025, Publisher: Nature Publishing Group, ISSN: 2045-2322.  DOI: 10.1038/s41598-025-09152-2. (visited on 08/06/2025).
- 5 S. Wu, M. Thalmann, and E. Schulz, “Two types of motifs enhance human recall and generalization of long sequences,” en, *Communications Psychology*, vol. 3, no. 1, pp. 1–12, Jan. 2025, Publisher: Nature Publishing Group, ISSN: 2731-9121.  DOI: 10.1038/s44271-024-00180-8. (visited on 03/05/2025).

- 6 K. Allen, F. Brändle, M. Botvinick, *et al.*, “Using games to understand the mind,” en, *Nature Human Behaviour*, vol. 8, no. 6, pp. 1035–1043, Jun. 2024, Publisher: Nature Publishing Group, ISSN: 2397-3374.  DOI: 10.1038/s41562-024-01878-9. (visited on 09/25/2024).
- 7 A. K. Jagadish, J. Coda-Forno, M. Thalmann, E. Schulz, and M. Binz, *Human-like Category Learning by Injecting Ecological Priors from Large Language Models into Neural Networks*, arXiv:2402.01821, May 2024.  DOI: 10.48550/arXiv.2402.01821. (visited on 10/24/2024).
- 8 T. A. Schäfer, M. Thalmann, E. Schulz, C. F. Doeller, and S. Theves, *The hippocampus supports interpolation into new states during category abstraction*, en, May 2024.  DOI: 10.1101/2024.05.14.594185. (visited on 07/18/2024).
- 9 M. Thalmann, T. A. J. Schäfer, S. Theves, C. F. Doeller, and E. Schulz, “Task imprinting: Another mechanism of representational change?” *Cognitive Psychology*, vol. 152, p. 101670, Aug. 2024, ISSN: 0010-0285.  DOI: 10.1016/j.cogpsych.2024.101670. (visited on 07/17/2024).
- 10 S. Wu, M. Thalmann, P. Dayan, Z. Akata, and E. Schulz, *Building, Reusing, and Generalizing Abstract Representations from Concrete Sequences*, arXiv:2410.21332 [cs], Oct. 2024.  DOI: 10.48550/arXiv.2410.21332. (visited on 03/05/2025).
- 11 M. Thalmann and E. Schulz, “Simple, Idiosyncratic Decision Heuristics in a Two-Armed Bandit Task,” en, in *2023 Conference on Cognitive Computational Neuroscience*, Oxford, UK: Cognitive Computational Neuroscience, 2023.  DOI: 10.32470/CCN.2023.1240-0. (visited on 10/07/2024).
- 12 M. Thalmann, A. S. Souza, and K. Oberauer, “How does chunking help working memory?” *Journal of Experimental Psychology: Learning, Memory, and Cognition*, vol. 45, no. 1, pp. 37–55, 2019, Place: US Publisher: American Psychological Association, ISSN: 1939-1285(Electronic), 0278-7393(Print).  DOI: 10.1037/xlm0000578.
- 13 M. Thalmann, A. S. Souza, and K. Oberauer, “Revisiting the attentional demands of rehearsal in working-memory tasks,” en, *Journal of Memory and Language*, vol. 105, pp. 1–18, Apr. 2019, ISSN: 0749-596X.  DOI: 10.1016/j.jml.2018.10.005. (visited on 06/28/2021).
- 14 A. S. Souza, M. Thalmann, and K. Oberauer, “The precision of spatial selection into the focus of attention in working memory,” en, *Psychonomic Bulletin & Review*, vol. 25, no. 6, pp. 2281–2288, Dec. 2018, ISSN: 1531-5320.  DOI: 10.3758/s13423-018-1471-4. (visited on 02/22/2021).
- 15 M. Thalmann, M. Niklaus, and K. Oberauer, “Estimating Bayes Factors for Linear Models with Random Slopes on Continuous Predictors,” *PsyArXiv*, Oct. 2017.  DOI: 10.17605/OSF.I0/4XQVR. (visited on 11/19/2017).
- 16 M. Thalmann and K. Oberauer, “Domain-specific interference between storage and processing in complex span is driven by cognitive and motor operations,” en, *Quarterly Journal of Experimental Psychology*, vol. 70, no. 1, pp. 109–126, Jan. 2017, ISSN: 1747-0218, 1747-0226.  DOI: 10.1080/17470218.2015.1125935. (visited on 02/26/2021).

Talks (Selected)

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| 2024/08/14 |  Mindful Science , Tuebingen, GER. Title: From Science to Industry – And All The Way Back. Or: Finetuning Your Importance Weights
 Annual Meeting of the Society for Mathematical Psychology , Tilburg, NL. Title: Are Exploration Strategies Suitable for Individual Differences Research? |
| 2024/06/29 |  ASIC , Molveno, IT. Title: Are Exploration Strategies Suitable for Individual Differences Research? |
| 2024/04/18 |  University of Geneva, Cognitive Development Chair, Faculty of Psychology and Educational Sciences Geneva, CH. Masters Seminar. Title: From Science to Industry – And All The Way Back. Or: Finetuning your Importance Weights |

Talks (Selected) (continued)

- **University of Geneva, Cognitive Development Chair, Faculty of Psychology and Educational Sciences** Geneva, CH. Title: Are Exploration Strategies Suitable for Individual Differences Research?
- 2023/08/31 ■ **UCL, Department of Experimental Psychology**, London, UK. Title: How to (not) measure exploration strategies in a few-armed bandit task?
- 2023/07/04 ■ **ASIC**, Kranjska Gora, SLO. Title: How to (not) measure exploration strategies in a two-armed bandit task
- 2022/06/21 ■ **ASIC**, Chamonix, FR. Title: Are Mental Representations Shaped by Task-Specific Goals?