

Maximilian M. Rabe

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## Education

- since 5/2018 **Cognitive Science (PhD)** at Universität Potsdam, Germany. Thesis project: *Computational Modeling of Eye Movement Control and Sentence Processing*. Supervisors: Ralf Engbert & Shravan Vasishth
- 9/2016-4/2018 **Psychology (M.Sc.)**, concentration *Cognition and Brain Science* at the University of Victoria, Canada. Thesis project: *Generalized Linear Mixed Modeling of Signal Detection Theory*. Supervisors: D. Stephen Lindsay & Michael E. J. Masson
- 10/2012-4/2016 **Psychology (B.Sc.)** at Universität Potsdam, Germany. Thesis project: *Mixed-Model Analysis of Trial History in Naming Experiments*. Supervisors: Reinhold Kliegl (Universität Potsdam) & Michael E. J. Masson (University of Victoria)
- 1/2015-4/2015 **Psychology (visiting student)** at the University of Victoria, BC, Canada
- 8/2014-12/2014 **Psychology (visiting student)** at the University of Mississippi, MS, USA
- 10/2011-9/2012 **Philosophy-Neuroscience-Cognition** at the Otto-von-Guericke Universität, Magdeburg, Germany, without degree
- 8/2002-6/2009 **High-school diploma** at Carl Bechstein Gymnasium, Erkner, Germany

## Awards

- 9/2017-8/2018 **Graduate Fellowship**, University of Victoria, CA\$ 15,000
- 9/2016-4/2018 **Graduate Study Scholarship**, German Academic Exchange Service (DAAD)
- 1/2015-4/2015 **PROMOS Scholarship**, German Academic Exchange Service, € 1,200

## Research Experience

- since 1/2018 **Doctoral research associate**, Universität Potsdam, Project B03 (*Modelling the interaction between eye-movement control and parsing processes*) of CRC 1287 (*Limits of Variability in Language*) with S. Vasishth und R. Engbert
- Bayesian and frequentist data analysis of empirical eye-movement data
  - Dynamical cognitive modeling of eye movements and sentence processing during reading

- 1/2015-4/2015      **Research internship**, University of Victoria, Psychology Department with D. Stephen Lindsay and Michael E. J. Masson
- 6/2014-8/2016      **Research assistant**, Universität Potsdam, Department of Psychology under supervision of Reinhold Kliegl

### Research Grants

- 10/2018-12/2020      North-German HPC Alliance (HLRN), worth approx. € 60,000

### Teaching Experience

- 10/2022-3/2023      **Instructor**, Universität Potsdam  
*Introduction to statistical computing with R*
- 7/2021      **Workshop**, EMS-SCS 2021, HSE St. Petersburg, Russia  
*Contrast coding using linear regression with hyper*
- since 10/2018      **Teaching assistant/Interim instructor**, Universität Potsdam  
*Empirical research project, Mathematical modelling* (Principal instructor: Ralf Engbert)
- 1/2017-4/2017      **Teaching assistant**, University of Victoria  
*Introduction to Mind and Brain*, Instructor: Adam Krawitz
- 10/2015-8/2016      **Teaching assistant/Laboratory assistant**, Universität Potsdam  
*Empirical research project*, Instructor: Reinhold Kliegl
- 10/2015-3/2016      **Teaching/Laboratory assistant**, Universität Potsdam  
*Hands-on introduction to scientific work*, Instructor: Doris Philip

### Reviewing (ad-hoc)

- Journals      Cognition, Journal of Open-Source Software
- Scholarships      APS Student Research Award (2017-2019), DAAD Study Scholarship for North America (11/2018 for the 2019/20 funding period)
- Exchange      Outgoing exchange student applications for Australian, US, or Canadian partner universities of the University of Potsdam (since 6/2020)

### Volunteering and Service

- 11/2018-09/2020      **Student Representative**, Senate commission on research and junior scientists, *Universität Potsdam*
- since 10/2018      **Campus Representative**, APS Student Caucus
- 6/2015-8/2016      **Director of Communication**, Psychology Students Union, *Universität Potsdam*

## Publications

- Rabe, M. M., Paape, D., Merten, D., Vasishth, S., & Engbert, R. (2023). SEAM: An integrated activation-coupled model of sentence processing and eye movements in reading. *arXiv*. <https://arxiv.org/abs/2303.05221>
- Engbert, R., Rabe, M. M., Schwetlick, L., Seelig, S. A., Reich, S., & Vasishth, S. (2021). Data assimilation in dynamical cognitive science. *Topics in Cognitive Science*, 26(2), 99–102. <https://doi.org/10.1016/j.tics.2021.11.006>
- Rabe, M. M., Chandra, J., Krügel, A., Seelig, S. A., Vasishth, S., & Engbert, R. (2021). A Bayesian approach to dynamical modeling of eye-movement control in reading of normal, mirrored, and scrambled texts. *Psychological Review*, 128(5), 803–823. <https://doi.org/10.1037/rev0000268>
- Engbert, R., Rabe, M. M., Kliegl, R., & Reich, S. (2021). Sequential data assimilation of the SEIR model for COVID-19. *Bulletin of Mathematical Biology*, 83, Article 1 (2021). <https://doi.org/10.1007/s11538-020-00834-8>
- Rabe, M. M., Vasishth, S., Hohenstein, S., Kliegl, R., & Schad, D. J. (2020). hypr: An R package for hypothesis-driven contrast coding. *The Journal of Open Source Software*, 5(48), Article 2134. <https://doi.org/10.21105/joss.02134>
- Seelig, S. A., Rabe, M. M., Malem-Shinitski, N., Risse, S., Reich, S., & Engbert, R. (2020). Bayesian parameter estimation for the SWIFT model of eye-movement control during reading. *Journal of Mathematical Psychology*, 95, Article 102313. <https://doi.org/10.1016/j.jmp.2019.102313>
- Masson, M. E. J., Rabe, M. M., & Kliegl, R. (2017). Modulation of additive and interactive effects by trial history revisited. *Memory & Cognition*, 45(3), 480–492. <https://doi.org/10.3758/s13421-016-0666-z>

## Presentations

- Rabe, M. M., Paape, D., Vasishth, S., & Engbert, R. (November 2021). *SEAM: An integrated activation-coupled model of sentence processing and eye movements in reading*. Poster presented at Psychonomic Society 62<sup>nd</sup> Annual Meeting.
- Rabe, M. M. (November 2019). *Eye-movement control during reading: Bayesian parameter inference of the dynamical SWIFT model*. Invited talk presented at University of Victoria, BC, Canada.
- Rabe, M. M., Chandra, J., Krügel, A., Seelig, S. A., & Engbert, R. (November 2019). *Bayesian inference of dynamical cognitive and oculomotor processes in the SWIFT model of reading*. Poster presented at Psychonomic Society 60<sup>th</sup> Annual Meeting, Montréal, QC, Canada.
- Seelig, S. A., Rabe, M. M., Malem-Shinitski, N., Reich, S., & Engbert, R. (September 2019). *Bayesian parameter estimation for the SWIFT model of eye-movement control during reading*. Poster presented at Cognitive Computational Neuroscience (CCN) 2019, Berlin, Germany.
- Rabe, M. M., Chandra, J., Krügel, A., Seelig, S. A., & Engbert, R. (August 2019). *Bayesian inference of the SWIFT model: Reading mirrored, scrambled, and normal texts*. Poster presented at European Conference on Eye Movements (ECEM) 2019, Alicante, Spain.
- Rabe, M. M., Kliegl, R., & Lindsay, D. S. (November 2017). *A generalized linear mixed model approach to signal selection theory in recognition memory experiments*. Poster presentation at the Psychonomic Society 58<sup>th</sup> Annual Meeting, Vancouver, BC, Canada.
- Rabe, M. M., Kliegl, R., & Lindsay, D. S. (March 2017). *Generalized linear mixed model of signal detection theory*. Poster presentation at NOWCAM, Burnaby, BC, Canada.
- Fallow, K. M., Rabe, M. M., & Lindsay, D. S. (November 2015). *Recognition memory response bias for paintings, words, and faces*. Poster presented at Psychonomic Society 56<sup>th</sup> Annual Meeting, Chicago, IL, USA.

**Software**

Rabe, M. M., Kliegl, R., & Schad, D. J. (2019). *designr: Balanced factorial designs with crossed random and fixed factors* [R package]. Retrieved from <https://github.com/mmrabe/designr>.

Rabe, M. M., Schad, D. J., Vasishth, S., & Kliegl, R. (2019). *hypr: Hypothesis matrix translation* [R package]. Retrieved from <https://github.com/mmrabe/hypr>.

**Skills**

Programming	C, Java, R, Matlab, XHTML, JavaScript, PHP, Python, Experimental programming (PsychoPy 2, E-Prime 2.0, OpenSesame, jsPsych)
HPC	MPI, OpenMP, Torque, MOAB, SLURM
Data management	Statistical and computational modeling in R and Python Database management (MySQL/MariaDB, PostgreSQL)
Languages	German (native), English (fluent), French, Spanish, Italian, Dutch, Danish
Office & Layout	Microsoft Office, OpenOffice/Libre Office, L <sup>A</sup> T <sub>E</sub> X, HTML, CSS

**Leaves and Breaks**

2/2022–4/2022	Parental leave (full time)
5/2022–8/2022	Parental leave (part time)
9/2022–10/2022	Parental leave (full time)

**Professional Memberships**

Psychonomic Society, Association for Psychological Science (APS), EuroScience, Potsdam Graduate School (PoGS), Society for the Improvement of Psychological Science (SIPS)