

Dominik Deffner

I am an evolutionary and computational behavioral scientist with a background in Psychology and Anthropology. My research broadly focuses on the individual-level learning processes and population-level social dynamics underlying human cultural adaptation. I mostly use behavioral group experiments, computational and statistical modeling as well as formal mathematical theory to better understand the unique adaptability of our species. At the moment, I am developing a causal inference framework for generalizability in cross-cultural research. I am also a committee member of the Early-career Social Learning Researchers (ESLR) society.

Education

- 2018 – 2021 **PhD (Dr.rer.nat.)**, *Max Planck Institute for Evolutionary Anthropology*, Leipzig, Germany, (submitted) *Behavioral Ecology and Cultural Evolution*.
- 2016 – 2017 **MSc**, *University of St Andrews*, UK, *Evolutionary and Comparative Psychology*.
- 2012 – 2016 **BSc**, *Philipps University Marburg*, Germany, *Psychology (focus on cognitive neuroscience)*.
- 2012 – 2016 **BA**, *Philipps University Marburg*, Germany, *Social and Cultural Anthropology, Philosophy*.

Academic Experience

- 03/2021 - 09/2021 **Postdoctoral Researcher**, *Collaborator: Prof Richard McElreath*, Max Planck Institute for Evolutionary Anthropology, Developing a causal inference framework for cross-cultural generalizability.
- 2018 – 2021 **Doctoral Researcher**, *Supervision: Prof Richard McElreath & Dr Anne Kandler*, Max Planck Institute for Evolutionary Anthropology.
- Theoretical and empirical projects in cultural evolution focussing on interplay between social learning, demography and life history
 - Mathematical and agent-based modeling, evolutionary simulations
 - Social learning lab group experiments and computational modeling
- 2016–2017 **MSc Student**, *Supervision: Prof Kevin Laland*, University of St Andrews.
- Niche construction and the strength and temporal dynamics of natural selection in the wild
 - Assembly of large dataset of selection gradients and Bayesian mixed-effect meta-analysis
- 2015–2016 **BSc Student**, *Supervision: Prof Anna Schubö*, Philipps University Marburg.
- Experimental research project on cooperation and attention in joint action
 - Training in neuroscientific methods including EEG, eye- and motion tracking
- 2015 **Guest Researcher**, *Supervision: Prof Dr Heejung Kim*, UC Santa Barbara.
- Experimental study on cultural frame switching in Asian-American biculturals
 - Training in cross-cultural, neuroscientific and genetic methods
- 2013–2016 **Research Assistant**, *Supervision: Prof Harald Lachnit*, Philipps University Marburg.
- Lab management including participant recruitment and allocation of experimenters
 - Conducted and analyzed (bio-)psychological experiments

Awards and Fellowships

- 2017–2018 **Stipend for PhD proposal**, *Max Planck Society (7,000€)*.

- 2012–2018 **Scholarship student**, *German Academic Scholarship Foundation ('Studienstiftung des deutschen Volkes', ca. 30,000€)*.
- 2017 **Dean's List (Distinction)**, *MSc Evolutionary and Comparative Psychology, final grade 17.7 out of 20 possible.*
- 2016 **Dean's List (Distinction)**, *BSc Psychology, final grade 1.0 on scale from 1 to 6.*
- 2015, 2016–2017 **International Exchange Scholarships**, *German Academic Scholarship Foundation ('Studienstiftung des deutschen Volkes', ca. 15,000€)*.
- 2011 **High school ('Abitur') Prizes**, *Grade of 1.1 and best in state of Bavaria in Latin exams.*

Publications

- Blaisdell, A., [...], **Deffner, D.** & Logan, C. J. (in principle acceptance). Do the more flexible individuals rely more on causal cognition? Observation versus intervention in causal inference in great-tailed grackles. *Peer Community In Ecology*, 100014.
- Logan, C. J., [...], **Deffner, D.** & Wascher, C. A. F. (in principle acceptance). Are the more flexible individuals also better at inhibition? *Peer Community In Ecology*, 100016.
- Deffner, D.**, & McElreath, R. (2020). When does selection favor learning from the old? *Social Learning in age-structured populations*. OSF preprints.
- Deffner, D.**, Kleinow, V. & McElreath, R. (2020). Dynamic Social Learning in Temporally and Spatially Variable Environments. *Royal Society Open Science*.
- Deffner, D.**, & McElreath, R. (2020). The importance of life history and population regulation for the evolution of social learning. *Philosophical Transactions of the Royal Society B*, 375(1803), 20190492.
- Clark, A. D.*, **Deffner, D.***, Laland, K., Odling-Smee, J., & Endler, J. (2020). Niche construction affects the variability and strength of natural selection. *The American Naturalist*, 195(1), 16-30. (*joint 1st authors)
- Deffner, D.**, & Kandler, A. (2019). Trait specialization, innovation and the evolution of culture in fluctuating environments. *Palgrave Communications*, 5-147.
- Smolla, M., Invernizzi, E., Bazhydai, M., Casoli, M., **Deffner, D.**, Faria, G. S., Jones, N., Kanwal, J., Staehler, A., & Uchiyama, R. (2018). Second annual workshop of the Association of Early-Career Social Learning Researchers in St Andrews, Scotland. *Evolutionary Anthropology*, 27(5): 21746, pp. 184-187.

Core Areas of Expertise

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| Behavioral Experiments | "Microsociety" learning experiments, interactive computer group experiments, joint action/attention paradigms, eye-tracking experiments. |
| (Bayesian) Statistics | Generalized mixed models, computational (reinforcement) learning models, causal inference, Gaussian process and spline regressions, meta-analytical models, network (social relations) models. |
| Cultural Evolution | Theoretical and empirical literature on evolution of social learning in human and non-human animals, cultural population dynamics, cultural adaptation. |
| Evolutionary Biology | Population genetics, evolutionary and behavioral ecology, life history theory, demography, niche construction and extragenetic inheritance. |
| Theoretical Modeling | Mathematical learning models, agent-based models, evolutionary game theory, stochastic processes, matrix population models, Wright-Fisher/Moran models. |

Language, Software and Programming skills

Language German (native), English (IELTS score: 8.0), Latin, Ancient Greek, some French/Italian.
Statistics R, Stan (probabilistic programming language for statistical inference), SPSS, MPlus.
Experimental oTree (Python-based platform for interactive experiments), E-Prime, MediaLab, PsyToolkit.
Open Science git and GitHub for reproducible workflows, R Markdown, preregistration on OSF.
Other Coding LaTeX, basic Python/Mathematica, some Julia/Matlab, little Java/HTML/CSS.

Academic Service

2020 **Co-Organizer**, Strategic Social Learning – An EHBEA 2020 Satellite Meeting.
2018– **Selection Panel Member**, German Academic Scholarship Foundation ('Studienstiftung des deutschen Volkes').
2018– **Social Secretary**, Association of Early-career Social Learning Researchers (ESLR).
2018–2020 **Works Council Member**, MPI for Evolutionary Anthropology.
2019 **Leading Organizer**, 3rd Annual ESLR Workshop at MPI.
2018–2019 **PhD Representative**, MPI for Evolutionary Anthropology.

Teaching and supervision

2019–2020 **Research internship**, Supervision of undergraduate student, co-authored manuscript.
2018 **Undergraduate seminar**, Cultural Evolution and Social Learning .
2015-2016 **Undergraduate seminar**, Perception Psychology and Cognitive Neuroscience.
2014-2016 **Tutor**, Experimental Methods.

References

Prof Kevin N. Laland MSc supervisor and collaborator; Professor of Behavioural and Evolutionary Biology at the University of St Andrews (knl1@st-andrews.ac.uk).
Dr Anne Kandler PhD co-supervisor; Head of Theory in Cultural Evolution Lab at Max Planck Institute for Evolutionary Anthropology (anne_kandler@eva.mpg.de).
Prof Richard McElreath PhD co-supervisor; Director of Department of Human Behavior, Ecology and Culture at Max Planck Institute for Evolutionary Anthropology (richard_mcelreath@eva.mpg.de).