Markus GRÜNER, MSc

Key Accomplishments

- 4 years experience in researching how simple shapes, selection history, reward, and salience can guide of visual attention
- Applied a simulation approach to estimate achieved statistical power and a method to analyse attentional guidance with fine-grained temporal resolution
- Multiple peer-reviewed publications in Q1 journals
- Extensive knowledge of data analysis and statistic
- Experience in teaching bachelor and master students

Personal Infos

Markus Grüner, MSc
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Date of birth: October 15th, 1988
Nationality: Austrian

Skills

University degrees
Master of Science Psychology
Bachelor of Science Psychology

Languages
German: Native language
English: Very good at speaking and writing

Software/Programming languages
LaTeX, MATLAB, PsychoPy
R, R-Markdown, Git
HTML, CSS, LimeSurvey Microsoft Office
Adobe Photoshop, InDesign, Illustrator
Typo3, Joomla, Moodle

Statistics/Methodology
GLMM, Power analyses, Simulations
(Mobile) Eye tracking, EEG,
Behavioral experiments, Surveys

Education

since 12/2018 · University of Vienna
Doctoral studies in Psychology
Degree: Ph.D. (expected end of 2023)
Thesis title: Investigating visual attentional guidance with a modified spatial cueing paradigm

2013—2016 · University of Vienna
Master's degree in Psychology
Degree: M.Sc. (Grade Point Average: 1.22)
Thesis title: Cueing effects of achromatic color cues during search for onset targets

2010—2013 · University of Vienna
Bachelor's degree in Psychology
Degree: B.Sc. (Grade Point Average: 1.45)

Thesis 2 title: Self-awareness as an Act of Cognition
Thesis 1 title: Erfahrungsbezogenes Denken und der Glaube an wissen-schaftliche Mythen
I achieved rank 1 of nearly 2,000 applicants on the admission exam.

Key Publications

Grüner, M., Goller, F., & Ansorge, U. (2021). Simple shapes guide visual attention based on their global outline or global orientation contingent on search goals. *Journal of Experimental Psychology: Human Perception and Performance*, 47(11), 1493–1515. https://doi.org/10.1037/xhp0000955

> Using multiple cue conditions allowed us to show that only specific shape features can guide visual attention. Additionally, I used a simulation approach to estimate the achieved statistical power.

Grüner, M., Goller, F., & Ansorge, U. (2023). Top-down knowledge surpasses selection history in influencing attentional guidance. *Attention, Perception, & Psychophysics*, 85, 985–1011. https://doi.org/10.3758/s13414-022-02648-3

> This publication provides strong evidence for the dominant influence of using a specific search criterion on involuntary attentional guidance, that would not be possible without the fine-grained temporal analysis used in this paper.

Forstinger, M., **Grüner, M.**, & Ansorge, U. (2022). Unseeing the white bear: Negative search criteria guide visual attention through top-down suppression. *Journal of Experimental Psychology: Human Perception and Performance*, 48(6), 613–638. https://doi.org/10.1037/xhp0001001

> I contributed the research design used in this publication, which, for the first time, allowed us to investigate and provide evidence for a novel aspect of top-down suppression.

RESEARCH EXPERIENCE

12/2018–05/2023 · University of Vienna
Research assistant (prae doc) in cognitive psychology
Department of Cognition, Emotion, and Methods in Psychology

Main projects
- Attentional guidance by simple 2D shapes
- Influence of selection history on attentional guidance
- Influence of physical salience on (top-down) attentional guidance
- Influence of reward on attentional guidance

Skills learned and used
- Finding literature and learning about new, complex topics
- Designing and programming behavioral experiments
- Analysing data with R using advanced statistics and methods (GLMMs, power analysis with simulations, etc.)
- Communicating scientific results (conference posters, talks, manuscripts) in English and German
- Developing new research questions and preparing grant proposals
- Teaching courses on cognitive psychology and R

08/2016–11/2018 · University of Vienna
Research assistant (applied research project)
Department of Cognition, Emotion, and Methods in Psychology

Leading a research project in cooperation with an industrial partner to investigate the influence of adaptive car lighting systems on attention, perception, and driving behavior.

Skills learned and used
- Teamwork and project management
- Using research to answer applied questions
- Designing experiments in real-world settings
- Collecting and analysing data from mobile eye trackers
- Deploying questionnaires with LimeSurvey
- Securing a follow-up FFG research grant

06/2015–01/2016 & 03/2016–06/2016 · University of Vienna
Internship and Student Assistant
Department of Cognition, Emotion, and Methods in Psychology

Skills learned and used
- Eye tracking and EEG data collecting
- Preparing and holding statistic tutorials
- Organizational tasks

TEACHING EXPERIENCE

Winter semester 2018 · University of Vienna
Introductory Seminar: Cognitive Foundations of Experience and Behaviour
Seminar for bachelor students, held in German

Summer semester 2019, 2020, and 2022 · University of Vienna
Seminar in Applied Psychology: Mind and Brain
Introduction to data analysis with R / Analyzing experimental psychological data with R
Seminar for master students, held in German on site and online

Publications

In Preparation/Submitted

Grüner, M. & Ansorge, U. Feature weighting can explain the influence of visual salience on bottom-up and top-down attentional guidance

Grüner, M. & Ansorge, U. Do reward-associated stimuli capture visual attention independent of top-down control settings? Preregistered: https://osf.io/376sw/

Peer-reviewed

Grüner, M., Goller, F., & Ansorge, U. (2021). Simple shapes guide visual attention based on their global outline or global orientation contingent on search goals. *Journal of Experimental Psychology: Human Perception and Performance*, 47(11), 1493–1515. https://doi.org/10.1037/xhp0000955

Grüner, M., Goller, F., & Ansorge, U. (2023). Top-down knowledge surpasses selection history in influencing attentional guidance. *Attention, Perception, & Psychophysics*, 85, 985–1011. https://doi.org/10.3758/s13414-022-02648-3

Forstinger, M., **Grüner, M.**, & Ansorge, U. (2022). Unseeing the white bear: Negative search criteria guide visual attention through top-down suppression. *Journal of Experimental Psychology: Human Perception and Performance*, 48(6), 613–638. https://doi.org/10.1037/xhp0001001

Ansorge, U., Büsel, C., Forstinger, M., Gugerell, D., **Grüner, M.**, Pomper, U., Stolte, M., Schmid, R. R., & Valuch, C. (2021). Procedural control versus resources as potential origins of human hyper selectivity. *Frontiers in Psychology*, 12, Article 718141. https://doi.org/10.3389/fpsyg.2021.718141

Huber-Huber, C., Steininger, J., **Grüner, M.**, & Ansorge, U. (2021). Psychophysical dual-task setups do not measure pre-saccadic attention but saccade-related strengthening of sensory representations. *Psychophysiology*, 58(5), Article e13787. https://doi.org/10.1111/psyp.13787

Grüner, M. & Ansorge, U. (2017). Mobile eye tracking during real-world night driving: A selective review of findings and recommendations for future research. *Journal of Eye Movement Research*, 10(2), 1–18. https://doi.org/10.16910/jemr.10.2.1

Conference paper/contributions

Grüner, M. & Ansorge, U. (2022). *The influence of task-relevance and awareness on reward-driven attentional capture* [Talk]. 44th European Conference on Visual Perception (ECVP), 28.8.2022–1.9.2022, Nijmegen, Netherlands.

Grüner, M. & Ansorge, U. (2022). *The influence of physical salience on goal-driven attentional guidance* [Poster presentation]. 64th Conference of Experimental Psychologists (TeaP), 20.–23.3.2021, Köln, Germany.

Grüner, M., Goller, F., & Ansorge, U. (2021). *The influence of learned versus instructed target features on attentional control settings* [Talk]. 63rd Conference of Experimental Psychologists (TeaP), 14.–17.3.2021, Ulm, Germany.

Forstinger, M., **Grüner, M.**, & Ansorge, U. (2021). *Goal-directed suppression of visual attention* [Poster presentation]. 63rd Conference of Experimental Psychologists (TeaP), 14.–17.3.2021, Ulm, Germany.

Grüner, M., Goller, F., & Ansorge, U. (2020). *Only learned target features guide visual attention* [Poster presentation]. 62nd Conference of Experimental Psychologists (TeaP), 22.–25.3.2020, Jena, Germany.

Grüner, M., Goller, F., & Ansorge, U. (2019). *The emergence of top-down search templates: Instruction vs. Reinforcement learning* [Poster presentation]. 21st Conference of the European Society for Cognitive Psychology (ESCoP), 25.–28.9.2019, Tenerife, Spain.

Grüner, M., Goller, F., & Ansorge, U. (2019). *Basic shapes guide visual attention based on search goals* [Poster presentation]. 42nd European Conference on Visual Perception (ECVP), 25.–29.8.2019, Leuven, Belgium

Grüner, M., Goller, F., & Ansorge, U. (2018). *Singleton search is a top-down strategy* [Poster presentation]. 60th Conference of Experimental Psychologists (TeaP), 11.–14.3.2018, Marburg, Germany.

Grüner, M., Hartmann, P., Ansorge, U., & Büsel, C. (2017). *The influence of light-induced dynamics on eye movements: A real-world driving study* [Poster presentation]. 19th European Conference on Eye Movements (ECEM), 20.–24.8.2017, Wuppertal, Germany

Grüner, M., Hartmann, P., & Ansorge, U. (2017). *The influence of light-induced dynamics on attention, perception, and driving behavior: A real-world driving study* [Talk]. 2. Kongress Fachgruppe Verkehrspsychologie, 14.–16.2.2017, Bergisch Gladbach, Germany.

Hartmann, P., **Grüner, M.**, Ansorge, U., Büsel, C., & Bednar, I. (2016). Assistive illumination, light-dynamics and expected driver's perception. *VISION*, 1–9. http://www.sia.fr/publications/461-vision

Patent

Hartmann, P., **Grüner, M.**, Ansorge, U., Büsel, C., Bednar, I., & Altmann, J. (2018). *Verfahren und System zur Steuerung bzw. zum Trainieren des Fahrverhaltens eines Fahrers über dessen Blicklenkung* (Österreichisches Patentamt Patent No. 519767). http://see-ip.patentamt.at/NPatentSuche/Details/d9fb290e-bca4-4e1a-a243-6dcb461172b0