

Clara Rastelli

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I am a co-tutelle doctoral candidate in Cognitive Science at the University of Trento and in Experimental Medicine at the University of Tübingen, where I work in the MEG Center. I am interested in exploring high-level cognitive processes, such as decision-making in the semantic space and creative problem-solving, across the lifespan in both health and disease, using behavioral, neuroimaging, and computational modeling.

Research Interests

Computational Cognitive Science • Semantic Cognition • Decision Science • Creative Problem-Solving • Large Language Models • Reinforcement Learning • Learning and Memory • Predictive Brain

Education

Joint	Cognitive Science , University of Trento (<i>Home</i>)	Oct 2019 – Dec 2024
Ph.D.	Experimental Medicine , University of Tübingen (<i>Host</i>)	
	• <i>Thesis Project</i> : Cognitive and brain mechanisms of semantic control in creative problem-solving	
M.Sc.	Applied Cognitive Psychology , University of Bologna	2013 – 2016
B.Sc.	Psychology , University of Bologna	2009 – 2013

Experience

Doctorate Visiting , MEG Center	University of Tübingen, DE
• I researched cognitive control during story ideation using MEG and fMRI, applying Deep Learning to both behavioral and neuroimaging data.	Nov 2020 – Feb 2021
Research Assistant , Dep. of Psychology and Cognitive Science	University of Trento, IT
• I quantify the biometric impact of new technologies on health improvement.	Jan 2018 – 2019
Research Internship , ARC, Centre of Excellence in Cognition and its Disorder	Macquarie University, AUS
• I research sound perception and musical improvisation, while assisting with experiments using EEG and tDCS.	Oct 2016 – Jun 2017

Teaching Experience

Lecturer , Theories and Application of Pattern Recognition (ING-INF/05)	University of Trento, IT
• Module: Neural Network's simulations	2019 – 2021
Teaching Assistant , Neurophysiology (M-PSI/02)	University of Urbino, IT
	2014 – 2016

Publications

Neural dynamics of semantic control underlying generative storytelling	2024
Rastelli, C. , Greco, A., Gabriele, P., Christoph, B., De Pisapia, N. bioRxiv, 2024-03. 🔗 (under revision Comm. Bio.)	
Statistical learning of incidental perceptual regularities induces sensory conditioned cortical responses	2024
Greco, A., D'Alessandro, M., Gallitto, G., Rastelli, C. , Braun, C., Caria, A. Biology, 13(8), 576 🔗	

A Supervised Machine Learning Approach to Classify Brain Morphology of Professional Visual Artists versus Non-Artists	2023
Greccucci, A., Rastelli, C. , Bacci, F., Melcher, D., De Pisapia, N. Sensors, 23(9), 4199.	
Balancing novelty and appropriateness leads to creative associations in children	2022
Rastelli, C. , Greco, A., De Pisapia, N., Finocchiaro, C. PNAS nexus, 1(5), pgac273.	
Simulated visual hallucinations in virtual reality enhance cognitive flexibility	2022
Rastelli, C.* , Greco, A.*, Kenett, Y. N., Finocchiaro, C., De Pisapia, N. Scientific reports, 12(1), 4027.	
Creativity as an information-based process	2022
De Pisapia, N., Rastelli, C. Rivista internazionale di Filosofia e Psicologia, 13(1), 1-18.	
Increased entropic brain dynamics during DeepDream-induced altered perceptual phenomenology	2021
Greco, A., Gallitto, G., D'Alessandro, M., , Rastelli, C. Entropy, 23(7), 839.	
The Art of Happiness: an explorative study of a contemplative program for subjective well-being	2021
Rastelli, C. , Calabrese, L., Miller, C., Raffone, A., De Pisapia, N. Frontiers in Psychology, 12, 96.	
Revealing the role of divergent thinking and fluid intelligence in children's semantic memory organization	2021
Rastelli, C. , Greco, A., Finocchiaro, C. Journal of Intelligence, 8(4), 43.	
Looking for the Kennformen of the Italian verb paradigm. An experimental study	2020
Bertinetto, P. M., Finocchiaro, C., , Rastelli, C. Acta Linguistica Academica, 67(2), 219-246	

Conference & Poster

Rastelli, C. , Greco A., Finocchiaro, C., De Pisapia N., Christoph Braun. Cognitive and neural mechanism underlying creative story generation. Poster presentation at the <i>Systems Neuroscience Symposium 2023</i> . Tübingen. Sep, 14-15 2023.	2023
Greco A., Rastelli, C. , De Pisapia N. Finocchiaro, C. Children efficiently regulate semantic exploration to generate creative word associations. Oral presentation at the <i>Complexity and Cognition, CompCog23</i> Rovereto. Feb 1 2023.	2023
Rastelli, C. , Greco, A., De Pisapia N. Finocchiaro, C. Exploring semantic search strategies underlying creative word association in children. Oral presentation at the <i>18th Annual Conference of the Italian Association of Cognitive Sciences, AISC</i> . Rovereto. Dec 17 2022.	2022
Rastelli, C. , Greco, A., Kenett, Y.N., Finocchiaro, C. De Pisapia N. Deepdream Altered Perceptual Phenomenology in VR facilitates Cognitive Flexibility. Society for the Neuroscience of Creativity, SfNC. May 12 2022.	2022
Rastelli, C. , Greco, N., Braun, C., Finocchiaro, C., De Pisapia, N. MEG alpha power decodes creative vs non-creative stories. Poster presented at the <i>25th annual meeting of the Organization for Human Brain Mapping (OHBM)</i> . June 24 2021.	2021

Rastelli, C. , Greco A., Finocchiaro C., De Pisapia N. Computational assessments of creativity in short stories. <i>International Conference on Computational Creativity, ICCI'20</i> . Doctoral consortium section. Virtual Conference. Sep 11 2020.	2020
Rastelli, C. , Finocchiaro C. Semantic networks predict differences in fluid intelligence and divergent thinking among children. Oral presentation at the <i>European Collaborative Creativity Conference (EC3)</i> . Marconi Institute for Creativity, University of Bologna, June 20-22 2019.	2019
Greco, A., Gallitto, G., Rastelli, C. . Brain dynamics during induced altered perceptual phenomenology revealed by multiscale permutation entropy and functional connectivity networks. Conference presented at the <i>1st annual meeting of the Conference on Complex Systems (CCS)</i> . Trento, Italy.	2019
Rastelli, C. , Greco, A., Finocchiaro, C. Small-world properties of creative semantic networks in low and high fluid intelligence children. Conference presented at the <i>1st annual meeting of the Conference on Complex Systems (CCS)</i> . Trento, Italy.	2019
Greco, A., Rastelli, C. On Naturalized Creativity: a complex hypothesis on the neural correlates of creative process. Conference presented at the <i>44th annual meeting of Australasian Society for Experimental Psychology</i> . Newcastle, NSW, Australia.	2017
Rastelli, C. , Greco, A. Clinical implication of reversing maladaptive plasticity. Conference presented at the <i>44th annual meeting of Australasian Society for Experimental Psychology</i> . Newcastle, NSW, Australia.	2017

Language & Computational Skills

Natural Languages:

- Italian (Native)
- English (C1)
- German (A1)

Programming Languages:

- R
- Python
- Matlab
- LaTeX

ML and NLP software:

- SciKit-Learn
- PyTorch
- HuggingFace
- Spacy

Neuroimaging lab-experience:

- fMRI
- EEG
- MEG

Neuroimaging software:

- Fieldtrip
- SPM
- FSL
- FreeSurfer

Stimuli presentation software:

- OpenSesame
- Psychopy
- Psychtoolbox

Funding

University of Trento , Department of Psychology and Cognitive Science Financed by the Italian Government	Doctorate Scholarship 2019/2024 70,000€
University of Tübingen , MEG Center Financed by Erasmus trainee mobility program	Erasmus+ Research 2020/2021 12,000€
University of Trento , Dep. of Psychology and Cognitive Science Founded by the "CollegaMENTI" project	Research Scholarship 2018 5,000€