

# 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 statistical/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

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

## Experience

<b>Doctorate Visiting</b> , 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
<b>Research Assistant</b> , Dep. of Psychology and Cognitive Science	University of Trento, IT
• I quantify the biometric impact of new technologies on health improvement.	Jan 2018 – 2019
<b>Research Internship</b> , 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

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

## Publications

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

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

## Conference & Poster

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<b>Rastelli, C.</b> , 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., <b>Rastelli, C.</b> , 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
<b>Rastelli, C.</b> , 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
<b>Rastelli, C.</b> , 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
<b>Rastelli, C.</b> , 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

<b>Rastelli, C.</b> , 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
<b>Rastelli, C.</b> , 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., <b>Rastelli, C.</b> . 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
<b>Rastelli, C.</b> , 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., <b>Rastelli, C.</b> 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
<b>Rastelli, C.</b> , 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

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### 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

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**University of Trento**, Department of Psychology and Cognitive Science  
Financed by the Italian Government

Doctorate Scholarship  
2019/2022  
50,000€

**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€