Curriculum Vitae – Ambra Ferrari, PhD

E-mail ambra.ferrari@unitn.it Website ambrafer.github.io ORCID 0000-0003-1946-3884

Professional Experience

01/05/2024 – present Marie Skłodowska-Curie Postdoctoral Fellow

Affiliation CIMeC – Center for Mind/Brain Sciences, University of Trento, Rovereto, Italy Project Multimodal conceptual knowledge in preverbal infants (ERP and multivariate

decoding of infant and adult EEG)

Supervisor Prof. Eugenio Parise

01/08/2022 - 30/04/2024 Postdoctoral Researcher

Affiliation Max Plank Institute for Psycholinguistics & Donders Institute for Brain,

Cognition and Behaviour, Radboud University, Nijmegen, The Netherlands

Project Multimodal integration and prediction in face-to-face communication (online

audiovisual testing, psycholinguistics, Bayesian linear mixed modelling)

Supervisor Prof. Peter Hagoort

01/01/2020 - 31/07/2022 Postdoctoral Researcher

Affiliation Donders Institute for Brain, Cognition and Behaviour, Radboud University,

Nijmegen, The Netherlands

Project Statistical learning and predictive processing in the human brain (online testing,

signal detection theory, univariate and multivariate fMRI)

Supervisor Prof. Floris P. de Lange

Education

23/06/2021 Professional Psychology Qualification (Abilitazione Professionale)

National examination to access the Italian register of psychologists (Albo)

Passing Grade: 50/50

07/09/2015 – 31/12/2019 PhD in Computational Cognitive Neuroscience

Affiliation Computational Cognitive Neuroimaging Group, School of Psychology,

University of Birmingham, Birmingham, United Kingdom

Thesis title The interplay between attention and multisensory integration (psychophysics,

Bayesian computational modelling, univariate and multivariate fMRI and EEG)

Supervisor Prof. Uta Noppeney

15/09/2014 –01/09/2015 Apprenticeship for National Psychology Certification

Affiliation G.B. Rossi Hospital, Verona; Sant'Agostino Estense Hospital, Modena, Italy

Activity Clinical neuropsychology assessment and rehabilitation of cognitive disorders

following neural damage; cognitive stimulation and monitoring in Alzheimer's Unit; fMRI mapping of linguistic and motor brain areas prior to neurosurgery

Supervisors Dr. Valentina Varalta; Dr. Francesca Benuzzi

09/09/2014 Master's Degree in Cognitive Neuropsychology and Neuroscience

Passing Grade: 110/110 (cum laude)

Affiliation School of Cognitive Science, University of Trento, Rovereto, Italy

Thesis title Investigating cross-modal plasticity in deafness: an fMRI pilot study on global

and biological motion perception

Supervisor Prof. Olivier Collignon

11/09/2012 Bachelor's Degree in Cognitive Psychology

Passing Grade: 110/110 (cum laude)

Affiliation School of Cognitive Science, University of Trento, Rovereto, Italy

Thesis title Use of a light source for spatial reorientation by the species of fish Danio Rerio

Supervisor Prof. Valeria Anna Sovrano

Teaching and Supervision

01/05/2024 – present Guest Lecturer

Affiliation Department of Psychology and Cognitive Science, University of Trento

Activity Cognitive Neuroscience (Prof. Francesco Pavani)

Content: 6 hrs frontal teaching on the computational cognitive neuroscience of

multisensory integration (computation, algorithm, implementation)

Affiliation CIMeC – Center for Mind/Brain Sciences, University of Trento

Activity Cognitive Neuroscience of Infant Development (Prof. Eugenio Parise)

Content: 6 hrs interactive teaching (Journal Club format) on language

development (semantics, pragmatics) in preverbal infancy

01/05/2024 – present Co-supervisor of undergraduate and graduate students

Affiliation CIMeC – Center for Mind/Brain Sciences, University of Trento, Rovereto, Italy

Activity Weekly co-supervision of 1 PhD student and 2 MSc students for experimental

design, data acquisition, data analysis and manuscript preparation

(techniques: psychophysics; MRI; infant and adult EEG)

01/09/2020 – 30/04/2024 Co-supervisor of undergraduate and graduate students

Affiliation Max Plank Institute for Psycholinguistics & Donders Institute for Brain,

Cognition and Behaviour, Radboud University, Nijmegen, The Netherlands

Activity Weekly co-supervision of 2 PhD students for experimental design, data acquisition, data analysis and manuscript preparation (techniques: online

testing; psychophysics; MRI); organization and supervision of training

activities for 3 lab rotation MSc students

01/10/2017 – 31/07/2018 Co-supervisor of undergraduate students

Affiliation School of Psychology, University of Birmingham, United Kingdom

Activity Co-supervision of 1 BSc student for research internship and dissertation

(techniques: psychophysics; electrodermal activity and pupillometry

recordings)

01/10/2016 - 31/07/2017 Teaching assistant

Affiliation School of Psychology, University of Birmingham, United Kingdom

Activity Delivery of practical workshops on statistics for BSc students

01/10/2013 - 31/07/2014 Teaching assistant

Affiliation School of Cognitive Science, University of Trento, Rovereto, Italy

Activity Delivery of practical workshops on statistics for BSc students

Academic Service

08/2023 – present Review Editor

Frontiers in Psychiatry – Section Social Neuroscience

12/2021 – present Ad-hoc reviewer

Activity Peer-review in Q1 journals (Cereb Cortex; Imaging Neurosci; J Cog Neurosci;

Psych Science; Ann NY Acad Sci; Eur J Neurosci; Neuropsychologia; Plos One; Front Neurosci; Front Hum Neurosci; J Exp Psy: HPP; Q J Exp Psy; Mult

Res; Lang Cogn Neurosci; J Applied Psycholing; CR: PI)

2025 – present External member of PhD admission committee

SISSA Cognitive Neuroscience PhD program (Italy)

External examiner of PhD evaluation committee

2024 Sapienza University (Italy)

2022 CIMeC, University of Trento (Italy)

01/10/2021 - 30/09/2022 Postdoctoral representative

Affiliation Donders Centre for Cognitive Neuroimaging, Donders Institute for Brain,

Cognition and Behaviour, Radboud University, Nijmegen, The Netherlands

Onboarding of new postdocs; organization of Brown Bag Meetings; co-Activity

organization of Donders Career Day 2021; organization of postdocs social

activities; organization of postdoc information centre on the institute intranet

01/09/2021 - 31/07/2022 Journal Club organizer and chair

> Affiliation Predictive Brain Lab, Donders Institute for Brain, Cognition and Behaviour,

> > Radboud University, Nijmegen, The Netherlands

Organization of annual calendar and chairing of biweekly meetings Activity

Publications and Manuscripts

Peer-reviewed articles and preprints

Ferrari, A., Filippin, L., Buiatti, M., Parise, E. (2025, accepted in PLoS One). WTools: a MATLAB-based toolbox for time-frequency analysis of infant data.

Ferrari, A., de Lange, F. P., Akrami, A. (invited, under review in Current Opinions in Neurobiology). Where learning paths meet: Convergence and divergence of statistical and reinforcement learning.

Momentè, F., Suglia, A., Giulianelli, M., Ferrari, A., Koller, A., Lemon, O., Schlangen, D., Fernández, R., Bernardi, R. (2025). Triangulating LLM progress through benchmarks, games, and cognitive tests. arXiv.

Mazzi, G.*, Ferrari, A.*, Mencaroni, M. L., Valzolgher, C., Tommasini, M., Pavani, F., Benetti, S. (2025). Prior expectations guide multisensory integration during face-to-face communication. bioRxiv. *shared first authorship

Ferrari, A., Hagoort, P. (2025). Beat gestures and prosodic prominence interactively influence language comprehension. Cognition, 256, 106049.

Nazli, I., Ferrari, A., Huber-Huber, C., & de Lange, F. P. (2024). Forward and backward blocking in statistical learning. PLoS One, 19(8), e0306797.

Benetti, S.*, Ferrari, A.*, Pavani, F. (2023). Multimodal processing in face-to-face interactions: a bridging link between psycholinguistics and sensory neuroscience. Frontiers in Human Neuroscience. 17:1108354. *shared first authorship

Ferrari, A., Richter, D., & de Lange, F. (2022). Updating contextual sensory expectations for adaptive behaviour. The Journal of Neuroscience, 42(47), 8855-8869.

Ferrari, A., & Noppeney, U. (2021). Attention controls multisensory perception via two distinct mechanisms at different levels of the cortical hierarchy. PLoS biology, 19(11), e3001465.

Benetti, S., Zonca, J., Ferrari, A., Rezk, M., Rabini, G., & Collignon, O. (2021). Visual motion processing recruits regions selective for auditory motion in early deaf individuals. NeuroImage, 230, 117816.

Hickman, L. J., Keating, C. T., Ferrari, A., & Cook, J. L. (2021). Skin conductance as an index of alexithymic traits in the general population. Psychological Reports, 00332941211005118.

Beierholm, U., Rohe, T., Ferrari, A., Stegle, O., & Noppeney, U. (2020). Using the past to estimate sensory uncertainty. eLife, 9, e54172.

Noppeney, U., Jones, S. A., Rohe, T., Ferrari, A. (2018). See what you hear - How the human brain forms representations across the senses. Neuroforum, A169-A181.

Lee, S. A., Ferrari, A., Vallortigara, G., & Sovrano, V. A. (2015). Boundary primacy in spatial mapping: Evidence from zebrafish (Danio rerio). Behavioural processes, 119, 116-122.

Manuscripts in preparation

Ferrari, A.*, Mazzi, G.*, Rabini, G., Mencaroni, M. L., Pavani, F., Benetti, S. Neural mechanisms of multisensory integration during face-to-face communication.

Degano, G.*, Ferrari, A.*, Noppeney, U. Audiotactile encoding of music in the human brain.

Ferrari, A., Meijer, D., Noppeney, U. Attention selection and switching in multisensory causal inference.

Invited talks

Ferrari, A. (2025). The Bayesian mind: perceiving the world is an inference problem. Invited by Prof. Marco Formentin, Padova Neuroscience Center, Italy

Ferrari, A. (2024). Multimodality as a design feature of human cognition. Invited by Cognitive Neuroscience Department, SISSA, Italy

Ferrari, A. (2024). Bayesian Causal Inference in multimodal communication. Invited by Prof. Gabriella Vigliocco, UCL, UK

Ferrari, A. (2022). Bayesian Causal Inference in the mind and brain. Invited by Prof. Francesco Pavani, CIMeC, University of Trento, Italy

Conference Symposium Organization

Chairing of Nanosymposium "Cross-modal processing in humans" at SfN Neuroscience 2024, Chicago, IL, USA. 05/10/2024 – 09/10/2024.

Co-organization and chairing of the symposium "Multisensory processing in face-to-face communication" at the 21st International Multisensory Research Forum, Brussels, Belgium. 27/06/2023 – 30/06/2023

Organization and chairing of the symposium "How do we learn and predict structure in the world?" at the 18th NVP Winter Conference on Brain and Cognition, Egmond aan Zee, The Netherlands. 28/04/2022 – 30/04/2022

Conference Oral Presentations

Ferrari, A. (2025). Binding voices and faces: How the brain uses prior expectations to integrate multisensory signals in communication. Talk accepted at the 23rd International Multisensory Research Forum, Durham, UK. 15/07/2025 – 18/07/2025

Ferrari, A. (2024). Audiotactile encoding of music in the human brain. Nanosymposium talk at SfN Neuroscience 2024, Chicago, IL (USA). 05/10/2024 – 09/10/2024

Ferrari A. et al. (2024). Statistical learning of a hierarchical centre-embedded structure: influence of Zipf distribution and semantic biases. Talk presented at the Interdisciplinary Advances in Statistical Learning Conference, San Sebastián, Basque Country, Spain. 05/06/2024 – 07/06/2024

Ferrari, A. (2023). Interactive effects of prosody and beat gestures on spoken language comprehension. Talk presented at the 19th NVP Winter Conference on Brain and Cognition, Egmond aan Zee, The Netherlands. 14/12/2023 – 16/12/2023

Ferrari, A. (2023). Towards a neurocognitive model of multisensory processing in face-to-face communication. Talk presented at the 21st International Multisensory Research Forum, Brussels, Belgium. 27/06/2023 – 30/06/2023

Ferrari, A. (2022). Updating contextual visual expectations. Talk presented at the European Conference on Visual Perception (ECVP 2022), Nijmegen, The Netherlands. 28/08/2022 – 01/09/2022

Ferrari, A. et al. (2022). The neural signatures of incidental and intentional statistical learning. Talk presented at the 18th NVP Winter Conference on Brain and Cognition, Egmond aan Zee, The Netherlands. 28/04/2022 - 30/04/2022

Ferrari, A. (2019). Neural mechanisms of attention in multisensory decision-making. Talk presented at the Oscillations Workshop, Centre for Human Brain Health, Birmingham, UK. 10/05/2019

Ferrari, A. (2018). The interplay between attention and multisensory integration. Talk presented at the Attention & Oscillations Workshop, Centre for Human Brain Health, Birmingham, UK. 16/11/2018

Conference Poster Presentations

- **Ferrari, A.**, Mazzi, G., Rabini, G., Mencaroni, M. L., Tommasini, M., Valzolgher, C., Pavani, F., Benetti, S. (2025). How the brain controls multisensory integration in social action processing. Poster accepted at the Concepts, Actions and Objects (CAOs) Workshop, Rovereto, Italy. 07/05/2025 09/05/2025
- **Ferrari, A.**, Hagoort, P. (2024). Beat gestures and prosodic stress interactively influence language comprehension. Poster presented at the 28th Workshop on the Semantics and Pragmatics of Dialogue, Rovereto, Italy.
- 11/09/2024 12/09/2024
- **Ferrari, A.**, Mazzi, G., Mencaroni, M. L., Valzolgher, C., Pavani, F., Benetti, S. (2024). Bayesian Causal Inference governs multisensory integration during face-to-face communication. Poster presented at the Highlights in the Language Sciences Conference, Nijmegen, The Netherlands. 08/07/2024 11/07/2024
- Mazzi, G., Mencaroni, M. L., Rabini, G., Tommasini, M., Valzolgher, C., Pavani, F., **Ferrari, A.**, Benetti, S. (2024). Face-to-face social interaction in the human brain: assessing the role of a lateral processing pathway. Poster presented at the Concepts, Actions and Objects (CAOs) Workshop, Rovereto, Italy. 09/05/2024 11/05/2024
- **Ferrari, A.**, Mazzi, G., Mencaroni, M. L., Valzolgher, C., Pavani, F., Benetti, S. (2024). Prior expectations guide multisensory integration during face-to-face communication. Poster presented at the Concepts, Actions and Objects (CAOs) Workshop, Rovereto, Italy. 09/05/2024 11/05/2024
- Chen Y., **Ferrari A.**, Hagoort, P., Bocanegra, B., Poletiek, F. (2023). Learning hierarchical centre-embedded structures: influence of distributional properties of the input. Poster presented at the 19th NVP Winter Conference on Brain and Cognition, Egmond aan Zee, The Netherlands. 14/12/2023 16/12/2023
- **Ferrari, A.** (2023). How does audiovisual prosody influence spoken language comprehension? Poster presented at the 15th Annual Meeting of the Society for the Neurobiology of Language, Marseille, France. 24/10/2023 26/10/2023
- Mazzi, G., **Ferrari, A.**, Valzolgher, C., Tommasini, M., Pavani, F., Benetti, S. (2023). Domain-general Bayesian causal inference in multisensory processing of face-to-face interactions. Poster presented at the Concepts, Actions and Objects (CAOs) Workshop, Rovereto, Italy. 04/05/2023 06/05/2023
- Nazli, I., **Ferrari, A.**, Huber-Huber, C., & De Lange, F. P. (2022). Is statistical learning error-driven? Poster presented at the 4th International Conference on Interdisciplinary Advances in Statistical Learning, San Sebastian, Spain. 01/06/2022 03/09/2022
- Nazli, I., **Ferrari, A.**, Huber-Huber, C., & De Lange, F. P. (2022). Is statistical learning error-driven?. Poster presented at the 18th NVP Winter Conference on Brain and Cognition, Egmond aan Zee, The Netherlands. 28/04/2022 30/04/2022
- **Ferrari, A.**, & Noppeney, U. (2019). Attention influences how the brain integrates audiovisual signals into spatial representations. Poster presented at the 25th Annual Meeting of the Organization for Human Brain Mapping (OHBM 2019), Rome, Italy. 09/06/2019 13/06/2019
- Benetti, S., Zonca, J., Rabini, G., **Ferrari, A.**, Foa, V., Rezk, M., & Collignon, O. (2017). Functional selectivity for visual radial motion processing in the temporal auditory cortex of early deaf individuals. Poster presented at the Ten Years of Mind/Brain Sciences at the University of Trento, Rovereto, Italy. 19/10/2017 21/10/2017
- **Ferrari, A.**, & Noppeney, U. (2017). Endogenous modality-specific attention influences sensory reliability during multisensory integration. Poster presented at the Ten Years of Mind/Brain Sciences at the University of Trento, Rovereto, Italy. 19/10/2017 21/10/2017
- **Ferrari, A.**, & Noppeney, U. (2017). The role of endogenous modality-specific attention in multisensory integration. Poster presented at the International Multisensory Research Forum (IMRF 2017), Nashville, TN, USA. 19/05/2017 22/05/2017
- **Ferrari, A.**, & Noppeney, U. (2017). The role of endogenous modality-specific attention in multisensory integration. Poster presented at the Festival of Neuroscience, British Neuroscience Association (BNA), Birmingham, UK. 10/04/2017 13/04/2017

Major Collaborations

Uta Noppeney, Donders Institute for Brain, Cognition and Behaviour, Radboud University, The Netherlands. Topic: Multisensory integration

Francesco Pavani, **Stefania Benetti**, **Eugenio Parise**, CIMeC, University of Trento, Italy; **Gabriella Vigliocco**, University College London, UK; **Judith Holler**, Max Plank Institute for Psycholinguistics, The Netherlands; **James P. Trujillo**, University of Amsterdam, The Netherlands. Topic: Language

Raffaella Bernardi, CIMeC, University of Trento, Italy. Topic: Cognition in Al (Large Language Models)

Floris P. de Lange, Donders Institute for Brain, Cognition and Behaviour, Radboud University, The Netherlands; **Athena Akrami**, University College London, UK. Topic: Statistical learning and predictive processing

Grants & Awards

2024	SfN Training and Professional Development Award (\$2500)			
	Scholarship awarded based on outstanding academic profile to attend SfN			
	Neuroscience conference in Chicago, USA			

Marie Skłodowska-Curie European Postdoctoral Fellowship (€189.000)

Multimodal meanings for conceptual communication before and beyond spoken language (MultiMeans)

2019 Guarantors of Brain Travel Grant (£500)
Financial support to attend OHBM conference in Rome, Italy

2016 Merit prize (€2,700)
Scholarship awarded for outstanding achievement during MSc course

2014 Merit prize (€2,700)
Scholarship awarded for outstanding achievement during BSc course

Communication and Outreach

11/09/2024 Activity	Article in UniTrento Magazine Outreach article titled "Prima delle parole" to present and promote my research activities to the UniTrento community and beyond
29/11/2023	Blog post in Het Talige Brein Outreach article titled "How can we communicate with babies?" to share my passion for the study of multimodal communication from the first years of life
18-19/03/2023 Place Activity	Volunteer at InScience Film Festival Nijmegen, The Netherlands Accreditations and info desk management during annual science film festival
28/11/2022 Activity	Guest speaker at Scientificast podcast Invited interview on the cognitive neuroscience of multimodal integration and learning by Italian top-chart science podcast
23/09/2021 Activity	Guest speaker at Youtube channel for science outreach Invited live talk on the cognitive neuroscience of learning by Italian Youtube channel dedicated to science dissemination and outreach (IlariaFMath)
2017 – 2019 Place Activity	Pint of Science event manager Birmingham, United Kingdom Organization of 3 editions of an annual science festival (create and manage

science demos (e.g. perceptual illusions); host event

team of 5 volunteers; book venue and 6 speakers; organize and deliver

2016 - 2019

Open days volunteer

Place Activity School of Psychology, University of Birmingham, United Kingdom Laboratory demonstrations (piezo-tactile stimulation; eye tracking) during

university open days for high school students and their families

Skills

Trainings

Donders Centre for Cognitive Neuroimaging (Nijmegen, NL): 3T Siemens MRI

Centre for Human Brain Health (Birmingham, UK): 3T Philips MRI scanner

scanner operator qualification (2021: ~80h scanning)

operator qualification (2017-2019: ~150h scanning)

Technical Knowledge

Program MATLAB Python Jupyter Notebook SPM FSL The Decoding Toolbox FreeSurfer WTools SPSS Bambi Eyelink BIOPAC Student Lab PsPM Psychtoolbox NBS Presentation	Area Programming language Programming language Python coding Interface MATLAB MRI data analysis Python MRI data analysis MATLAB MRI data analysis Python MRI data analysis Python MRI data analysis MATLAB EEG data analysis Data analysis Python Bayesian modelling Eye-tracking data acquisition Physiological data acquisition Psycho-physiological data analysis MATLAB experiment builder Experiment builder	Knowledge Advanced Advanced Advanced Good Advanced Good Advanced Good Advanced Good Advanced Basic Basic Advanced Advanced
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Creative and networking skills

04/2021 – 06/2022: Creator and host of joint group meetings for the Predictive Brain lab (PI: Floris P. de Lange). Tasks: design structure of event; establish connection with other labs; organize panel of speakers across labs; host meetings. Established network of PIs: Lucia Melloni, Lars Muckli, Jan Theeuwes, Athena Akrami, Stefan van der Stigchel.

07/10/2019: Creator and host of academic skills workshop "What Next? Career tips for PhD students" at the School of Psychology, University of Birmingham, UK. Tasks: design structure of event; organize panel of speakers; organize refreshments through university funds; host meetings.

Languages

Italian (native speaker); English (advanced user, IELTS C1 level)

I authorize the processing of the personal data present in this curriculum vitae in compliance with the Legislative Decree 30 June 2003, n. 196 and the GDPR (EU Regulation 2016/679).

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